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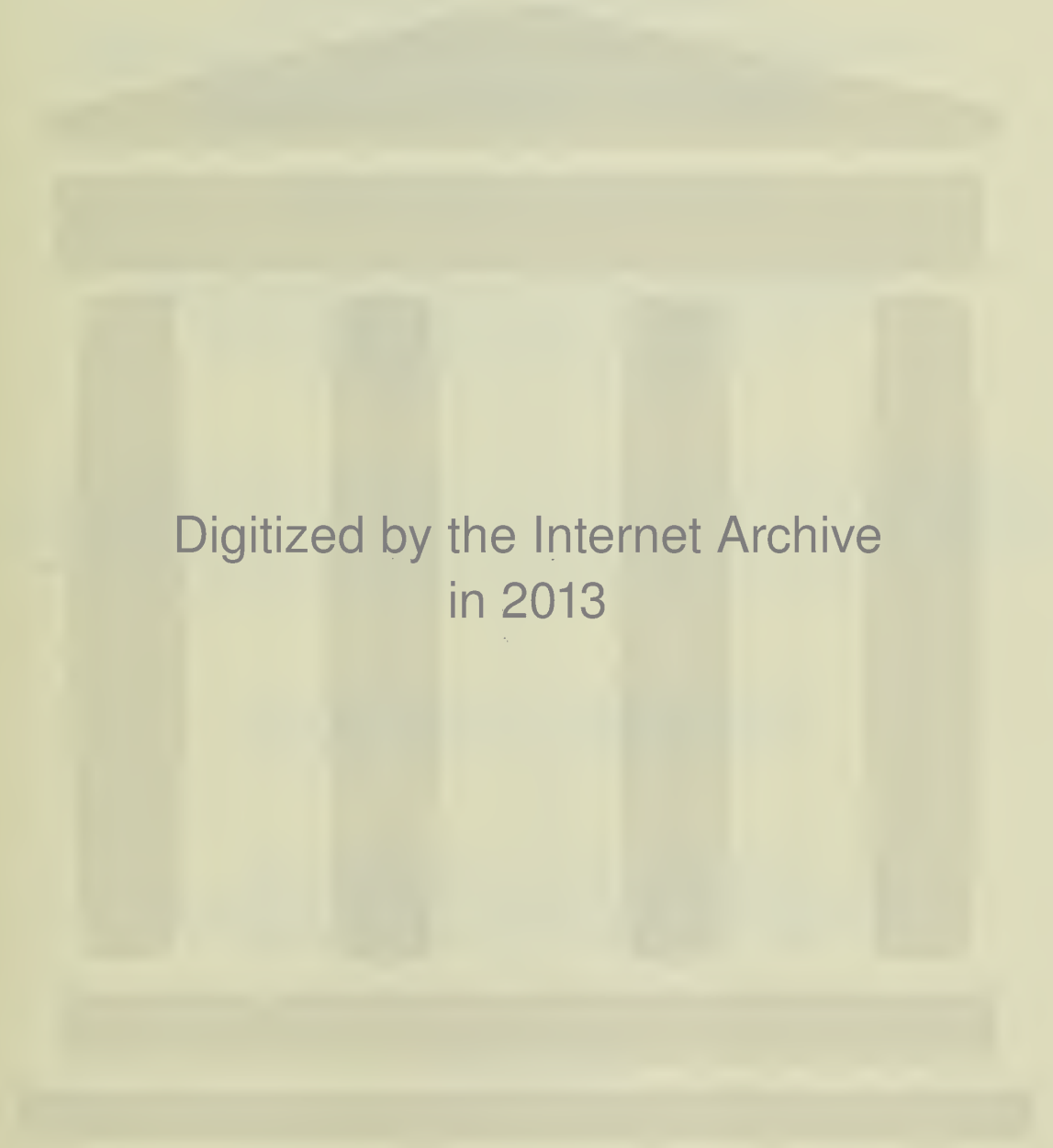

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SCH No.95063004
City Project No. 2000.048E

## VOLUME I

# TRANSBAY TERMINAL / CALTRAIN DOWNTOWN EXTENSION / REDEVELOPMENT PROJECT

in the City and County of San Francisco

## FINAL ENVIRONMENTAL IMPACT STATEMENT/ ENVIRONMENTAL IMPACT REPORT AND SECTION 4(f) EVALUATION

Pursuant to

National Environmental Policy Act of 1969, §102 (42 U.S.C. §4332); Federal Transit Laws (49 U.S.C. §5301(e), §5323(b) and §5324(b)); Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. §303); National Historic Preservation Act of 1966, §106 (16 U.S.C. §470f); 40 CFR Parts 1500-1508; 23 CFR Part 771; Executive Order 12898 (Environmental Justice); and California Environmental Quality Act, PRC 21000 *et seq.*; and the State of California CEQA Guidelines, California Administrative Code, 15000 *et seq.*

by the

**U.S. DEPARTMENT OF TRANSPORTATION**
**FEDERAL TRANSIT ADMINISTRATION**

and the

**CITY AND COUNTY OF SAN FRANCISCO,**
**PENINSULA CORRIDOR JOINT POWERS BOARD, AND**
**SAN FRANCISCO REDEVELOPMENT AGENCY**

**March 2004**

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**PENINSULA CORRIDOR JOINT POWERS BOARD, AND**
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## ABSTRACT

The *Transbay Joint Powers Authority*, the City and County of San Francisco, the Peninsula Corridor Joint Powers Board, and the San Francisco Redevelopment Agency propose to construct a new multi-modal Terminal on the site of the present Transbay Terminal, extend the Peninsula Corridor Service (Caltrain) from its current San Francisco terminus at Fourth and Townsend Streets to a new underground terminus beneath the new Terminal, and establish a Redevelopment Area Plan with related development projects, including transit-oriented development on publicly-owned land in the vicinity of the new multi-modal Terminal. The project is needed because the present Transbay Terminal, which was built in 1939, does not meet current *building codes, including ADA requirements,* or space utilization standards. The need to modernize the Transbay Terminal provides an opportunity to revitalize the surrounding area with a mix of land uses that includes both market-rate and affordable housing, and to extend Caltrain service from its current terminus outside the downtown area into the San Francisco employment core. Increases in Caltrain and other transit ridership, reductions in non-transit vehicle use and improvements in regional air quality, and revitalization of the Terminal area are expected to result. Impacts include the loss of the Transbay Terminal, *listed on the* National Register of Historic Places, and loss of the terminal loop ramp, a contributing element to the historic Bay Bridge, and up to 13 other historic buildings that are contributors to downtown historic districts; residential and business displacements; localized noise and vibration effects; adverse traffic impacts at seven intersections; loss of parking, and disruption during construction. Proposed mitigation measures include historic recordation, sound walls, high-resilience rail facilities, public information and management practices during construction, temporary bus terminal and bus storage and parking replacement, and pedestrian measures. Relocation assistance will be provided in accordance with the federal and state relocation acts.

# Preface

In 1997, a Draft Environmental Impact Statement / Draft Environmental Impact Report (Draft EIS/EIR) was circulated for the Caltrain San Francisco Downtown Extension Project, a public hearing was held, and public comments were received. The present *Final* EIS/EIR describes a different –albeit somewhat similar – project to that evaluated in the 1997 document. Various changes have occurred in project development and project-related conditions since the earlier environmental document was circulated. This Preface summarizes how this document responds to these changes.

The project described and evaluated in this new document is consistent with the Transbay Terminal Study that has been undertaken by the Metropolitan Transportation Commission / Bay Area Toll Authority in concert with the State of California, the City and County of San Francisco, AC Transit and other local transit service providers and other interested parties.

The description of the project alternatives responds to current design criteria to accommodate high-speed steel-wheel-on-rail technologies currently in use in Europe and under consideration by the California High-Speed Rail Authority for implementation in California, including a station in downtown San Francisco.

Many specific subjects have been updated, not only to address changes in area conditions that have occurred since the 1997 Draft EIS/EIR was issued, but also to reflect the three components of the present project. Background information and analysis for many subjects are entirely new, including: ridership, land use, engineering, capital costs, noise and vibration effects, cultural resources, traffic, transit, parking, and the project financial plan.

Given the extent of differences between the previous project and the present project, the Peninsula Corridor Joint Powers Board, the City and County of San Francisco, and the Federal Transit Administration *have* not *responded* to the public comments received on the 1997 Draft EIS/EIR. Only those comments received on the present document *are* addressed.

*The Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project Draft Environmental Impact Statement/Environmental Impact Report (Draft EIS/EIR) was released for public review on October 4, 2002. Notice of availability of the Draft EIS/EIR was published in the San Francisco Independent newspaper and posted at the Planning Department. Five hundred fifty newsletters were sent to the mailing list announcing the availability of the Draft EIS/EIR, and a letter was sent directly to property owners whose properties could be directly affected by the Project. Fifty 11"X17" posters were posted throughout the Project area, including along Second Street. Notices were sent to all property owners within 300 feet of the project boundary.*

*The Draft EIS/EIR was available for on-line review on the Transbay Joint Powers Authority (TJPA) web site. Three hundred eight two copies, both printed and compact disc versions, of the Draft EIS/EIR were mailed to agencies and individuals. The document was also available for review at the following locations:*

- *Caltrain Headquarters, Second Floor Reception, 1250 San Carlos Ave., San Carlos*
- *San Francisco Central Library, 100 Larkin Street (at Grove)*
- *City of Berkeley Central Library, 2090 Kittredge Street (at Shattuck)*
- *San Francisco Planning Department, 1660 Mission Street, First Floor Public Information Center*
- *AC Transit Headquarters, 1660 Franklin Street, Oakland (Board Secretary)*
- *Main libraries of cities along the Caltrain Corridor*

*Three public hearings were held:*

- *November 12, 2002 at 5:00 pm – San Francisco Redevelopment Agency Commission in the San Francisco City Hall,*
- *November 13, 2002 at 7:00 pm (with an open house at 6:30 pm) – Caltrain Headquarters, San Carlos, California, and*
- *November 26, 2002 at 12:30 pm – San Francisco Planning Commission in San Francisco City Hall.*

*At the request of the public, the comment period was extended by the Planning Commission on November 26 to December 20, 2002.*

*The final environmental documentation consists of three volumes. Volume I is the Final EIS/EIR (which is the Draft EIS/EIR as amended). Volume II contains responses to public comments on the Draft EIS/EIR, and Volume III contains the written comments and transcripts from the public hearings.*

*A Locally Preferred Alternative (LPA) was adopted in March 2003 by the Transbay Joint Powers Authority (TJPA) after consideration of the information presented in the Draft EIS/EIR, public and agency input from the circulation of the Draft EIS/EIR, meetings among affected stakeholders, community meetings and workshops, and the public hearings. The LPA consists of the following project components: the Transbay Terminal West Ramp Alternative with its associated bus ramps, circulation, and off-site storage; the Caltrain Downtown Extension with the "stacked drift" tunneling option for the segment between Townsend Street and Folsom Street, and the Second–to-Main Alternative; and the Transbay Redevelopment Plan Area "full build" development alternative.*

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# SUMMARY

## S.1 PURPOSE AND NEED FOR TRANSPORTATION IMPROVEMENTS

The primary purposes of the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project are to:

- Improve public access to bus and rail services;
- Modernize the Transbay Terminal and improve service;
- Reduce non-transit vehicle usage; and
- Alleviate blight and revitalize the Transbay Terminal area.

The project is needed because the present Transbay Terminal, which was built in 1939, does not meet current seismic safety or space utilization standards. The need to modernize the Transbay Terminal provides an opportunity to revitalize the surrounding area and to extend Caltrain service from its current terminus outside the downtown area into the San Francisco employment core. Figure S-1 shows the project's location.

Undertaking the project components would address the following associated needs:

- Provide a multi-modal transit facility that meets future transit needs;
- *Improve the Terminal as a place for passengers and the public to use and enjoy.*
- Alleviate the conditions of blight in the Transbay Terminal area;
- Revitalize the Transbay Terminal area with a more vibrant mix of land uses that includes both market-rate and affordable housing;
- Facilitate transit use by developing housing next to a major transit hub;
- Improve Caltrain service by providing direct access to downtown San Francisco;
- Enhance connectivity between Caltrain and other major transit systems;
- Enable direct access to downtown San Francisco for future intercity and/or high-speed rail service;
- Accommodate projected growth in travel demand in the San Jose – San Francisco corridor;
- Reduce traffic congestion on US Highway 101 and I-280 between San Jose and San Francisco and other routes;
- Reduce vehicle hours of delay on major freeways in the Peninsula corridor;
- Improve regional air quality by reducing auto emissions;
- Support local economic development goals; and
- Enhance accessibility to employment, retail, and entertainment opportunities.

Figure S-1: Project Location

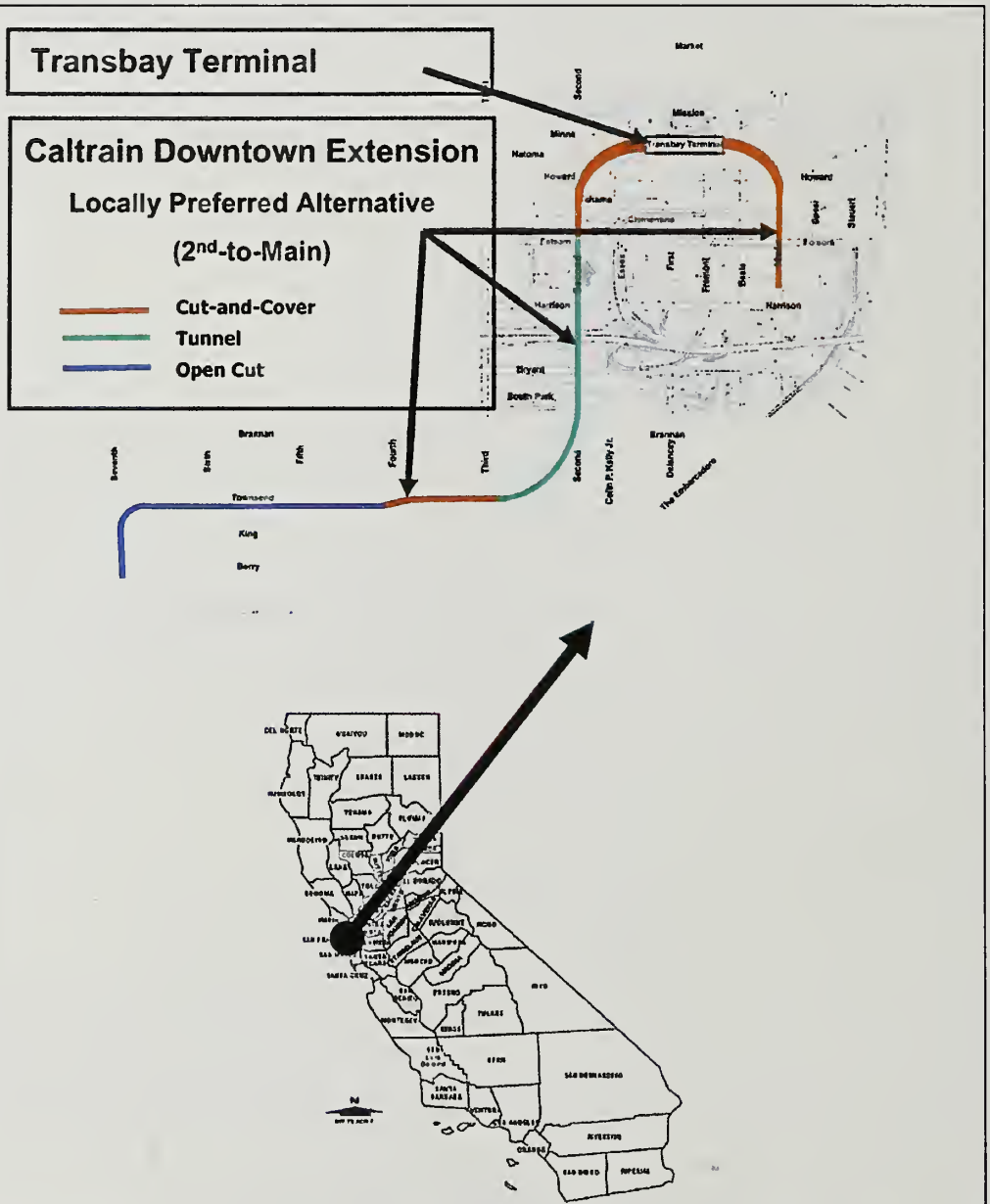



**Figure S-1: Project Location and Vicinity Map**

The Metropolitan Transportation Commission, State of California, City and County of San Francisco, and area transit providers (AC Transit, Muni, Golden Gate, SamTrans, and JPB) have evaluated options for replacement of the 60-year-old Transbay Terminal facility, due to its age, need for seismic upgrade, and inadequate facility layout. A properly designed, new terminal would improve space utilization, passenger circulation, signage, security, safety, and the overall transit-rider experience.

A multi-modal transportation facility would provide a centralized location for public and private bus and rail services in San Francisco's growing Financial District/South of Market Area and would enhance transit access for passengers arriving in and departing San Francisco. With its location near housing and major retail and commercial opportunities, it would increase transit ridership, thus reducing the number of non-transit vehicles traveling on area streets, highways, and bridges. Reduction in automobile vehicle miles of travel would result in reduced vehicular air emissions and an improvement in air quality.

Extension of the Caltrain Commuter Rail system 1.3 miles to Downtown San Francisco would close the gap than now exists between the train's current terminus station at Fourth and Townsend the employment center of the region, providing a seamless transportation link between the Peninsula and the heart of San Francisco. It would be consistent with Proposition H passed by the voter of San Francisco resolving that Caltrain should be extended to the Transbay Terminal site, and it would enable provision of high-speed rail service for a proposed statewide system.

The Redevelopment Plan would include a new Transbay Terminal, portions of the Caltrain Downtown extension within the Project Area, and redevelopment of other underutilized property in the Transbay Terminal area. Redevelopment activities, including redevelopment of the Terminal, would benefit from utilization of tax increment financing and the ability to assemble properties, install public improvements, and provide office, retail/hotel, and residential development, including affordable housing.

## S.2 ALTERNATIVES

A description of the three alternatives evaluated in this Draft EIS/EIR is provided below.

### S.2.1 No-Project Alternative

The No-Project Alternative consists of existing Caltrain service with funded improvements, other committed bus, rail, and roadway improvements, a BART extension to the San Francisco International Airport, and proposed development in downtown San Francisco in the 2020 horizon year. This is the No-Project Alternative under CEQA and the baseline alternative for purposes of NEPA.

Among the funded Caltrain service improvements are: service increases in daily trains between San Francisco and San Jose, and between San Jose and Gilroy; rehabilitation improvements, enhancements and additions to the existing Caltrain system; signal system modernization improvements; track improvements at the new Millbrae Intermodal facility that improve intermodal connections with BART; Electrification of the entire Caltrain line from Gilroy to its present San Francisco terminus at Fourth and Townsend Streets.

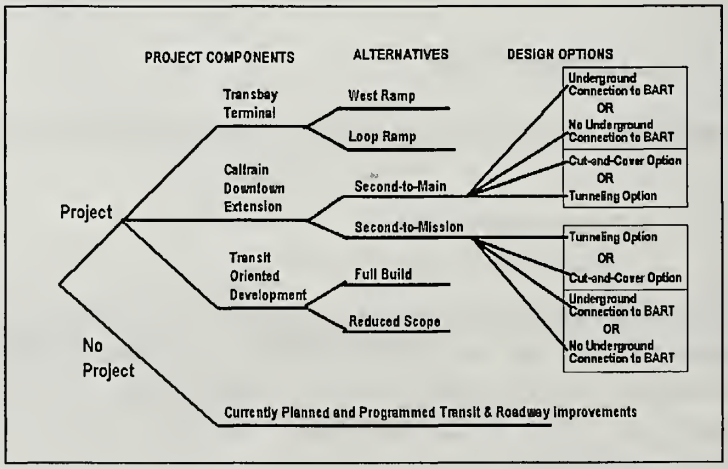
The No-Project Alternative includes all existing Muni service, plus major planned, ongoing, or constructed Muni projects, such as the S-Castro-Embarcadero Shuttle, the Third Street Light Rail project, and the Central Subway. Also included in the No-Project Alternative is existing BART service, *including* the extension to the San Francisco International Airport, *that* also interfaces with Caltrain and Samtrans bus services at the new Millbrae Intermodal Station. The No-Project Alternative further includes the changes to Samtrans bus service that were implemented in August 1999, the completion of Caltrans San Francisco Seismic Retrofit projects, and the completion of roadway and street improvements planned and programmed by the City and County of San Francisco's Department of Parking and Traffic or the Department of Public Works.

### S.2.2 Project Components

The proposed project would be located in Downtown San Francisco (See Figure S-1) and has three major components:

- A new, multi-modal Transbay Terminal on the site of the present Transbay Terminal;
- Extension of Caltrain commuter rail service from its current San Francisco terminus at Fourth and Townsend Streets to a new underground terminus underneath the proposed new Transbay Terminal; and
- Establishment of a Redevelopment Area Plan with related development projects, including transit-oriented development on publicly owned land in the vicinity of the new multi-modal Transbay Terminal.

Two alternatives are under consideration for each of the major project components. Other components of the project include a temporary bus terminal facility to be used during construction, a new, permanent off-site bus storage/ layover facility, reconstructed bus ramps leading to the west end of the new Transbay Terminal, and a redesigned Caltrain storage yard.



### S.2.2.1 Refinements to the Project and EIS/EIR

*Refinements have been made to the Project and EIS/EIR since the Draft EIS/EIR was published. These refinement include*

- ***Adoption of a Locally Preferred Alternative.*** *Following the U.S. Department of Transportation, Federal Transit Administration guidance and regulations, the Transbay Joint Powers Authority (TJPA) adopted in March 2003 the West Ramp Transbay Terminal, Second-to-Main, Tunneling, Full Build Options as the components to be included in the Locally Preferred Alternative (LPA) for inclusion in this Final EIS/EIR.*

- ***Movement of the Transbay Terminal Footprint to the West.*** *In response to public comment on the Draft EIS/EIR, the footprint of the new Transbay Terminal is proposed to be moved to the west (approximately 150 feet) of the location shown in the Draft EIS/EIR.*

- ***Elimination of the Temporary Bus Ramps to the Temporary Terminal.*** *In response to public comments on the Draft EIS/EIR, AC Transit bus access to the temporary terminal will no longer make use of a temporary bus ramp between the Bay Bridge and the temporary terminal during operation of the temporary facility.*

- ***Supplemental Air Emissions Assessment and Supplemental Noise Assessment of the Permanent Off-Site Bus Storage Facility*** *In response to public comments on the Draft EIS/EIR, a supplemental air emissions assessment and supplemental noise assessment was made of the proposed permanent off-site bus storage facility under the West Approach to the Bay Bridge between Second and Fourth Streets..*

- ***Refinements to the 2nd-to-Main and 2nd-to-Mission Caltrain Extension Alternatives.*** *Alignments and Station Layout. In response to public comments on both alternatives for the Caltrain Extension contained in the Draft EIS/EIR, engineering refinements were made to the Second-to-Mission and Second-to-Main options for the Caltrain Downtown Extension. Refinements included changes to the track, platform, and tail track layouts.*

- ***Revised Caltrain Operating Plan Assumptions*** *The number of daily Caltrain trains assumed to be operated in the Year 2020 has been revised downward from 170 to 132 reflecting more recent planning of the Peninsula Corridor Joint Powers Board.*

- ***Revised Project Construction/Implementation Schedule.*** *In response to public comments on the Draft EIS/EIR, the proposed project construction and implementation schedule has been refined.*

- ***Revised Project Capital Costs.*** *In response to public comments on the Draft EIS/EIR, capital cost estimates for both the Transbay Terminal and the Caltrain Downtown Extension have been refined for the LPA, resulting in an overall cost reduction of $143.7 million in 2003 dollars. The refined costs have been assigned to an anticipated year of expenditure under the refined implementation schedule, and inflation rates have been applied, providing a year-of-expenditure cost estimate for the LPA.*

- ***Revised Project Financial Plan.*** *The Project's financial plan has been refined to reflect the revised capital costs, the anticipated year of expenditure for various costs, and recent events regarding various funding sources.*

- ***Release of Draft Transbay Redevelopment Project Area Design for Development Vision and Redevelopment Boundary Revision.*** *In response to public comments on the Draft EIS/EIR and to advance the planning work for the proposed Transbay Redevelopment Area, the San Francisco Redevelopment Agency has released for public review the Draft Transbay Redevelopment Project Area Design for Development Vision (August 2003). The Draft Vision provides additional detail regarding the possible elements of the final Redevelopment Area Plan. A revision was also made to the proposed redevelopment area boundary in response to public comments.*

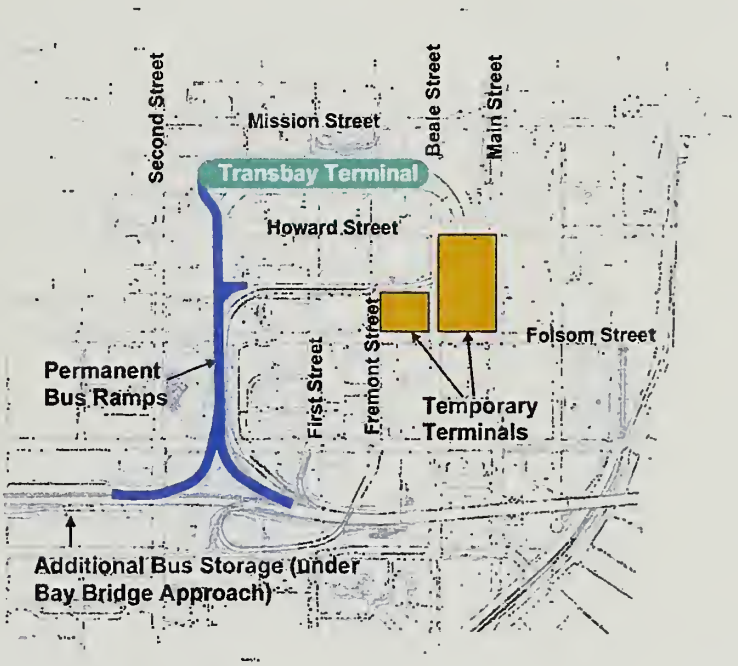
- ***Revisions to the Final EIS/EIR in Response to Public Comments on the Draft EIS/EIR.*** *Other revisions/refinements have been made in this Final EIS/EIR in response to public comments received on the Draft EIS/EIR. Volume II of this Final EIS/EIR contains the comments given on the Draft EIS/EIR and the responses to these comments. As indicated in Volume II, responses at times led to revision to the Final EIS/EIR. All refinements and revisions to the Draft EIS/EIR are outlined in this Final EIS/EIR in italics.*

### S.2.2.*2* Transbay Terminal Alternatives

Two alternatives are being studied for a new Transbay Terminal. Under either alternative, a new multi-modal terminal would be located at the same site as the existing terminal at Mission and First Streets.

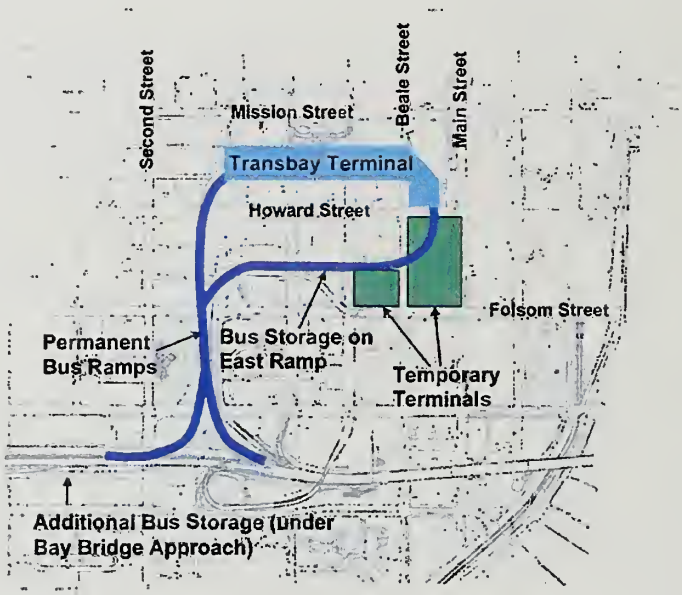
Bus ramps would connect directly from the terminal to the Bay Bridge, while an underground rail facility would allow the extension of Caltrain to downtown and provide space for potential future East Bay commuter rail and California's high-speed intercity rail.

**West Loop Alternative.** The existing western and eastern bus ramps between the Transbay Terminal and the Bay Bridge would be demolished, and new ramps would be constructed on the west side of the new Transbay Terminal, opening up additional space for development on the east side. The new bus ramps would be in approximately the same position as the existing ramps on the west side of the terminal and paralleling Essex Street. Bus turnaround loops would be provided on each bus level at the east end of the terminal. As the ramps approach the Bay Bridge, they would be stacked in a double-deck configuration. This alternative includes a terminal one block (165 feet) wide by *two* blocks (1,300 feet) long. It would include six levels, with four levels above ground and two below. Beginning at the lowest level, these include 1) a Train Level for Caltrain platforms, 2) Train Mezzanine Level for train passenger ticketing services, 3) Street Level for Muni vehicles and Golden Gate Transit buses, 4) Concourse Level for pedestrian circulation and substantial areas for joint development, 5) AC Transit Level, and 6) Upper Bus Level for other bus service (Muni service to Treasure Island, paratransit, Greyhound, and private operators). *This West Ramp Alternative was selected by the Transbay Joint Powers Authority as the Transbay Terminal component of the Locally Preferred Alternative. The footprint of the terminal has been moved approximately 150 feet to the west from its proposed location in the Draft EIS/EIR and would no longer span Beale Street. This shift reduces Project capital costs but does not affect the Project's environmental impacts or the operating efficiency of the terminal.*




**Transbay Terminal West Ramp Alternative**
**Location of Terminal Components**

**Loop Ramp Alternative.** This alternative would involve the demolition and reconstruction of both the existing western and eastern bus ramps between the Transbay Terminal and the Bay Bridge. The new Transbay Terminal would be one block wide and three and three-fourths blocks in length. It would include five levels, with two levels above ground and two below. The lower four levels (Train, Train Mezzanine, Street, and Concourse) would be very similar to the West Loop Alternative, although there would be less area available for joint development. The fifth level would be the Bus Level, which would accommodate AC Transit and all other bus operators.




**Transbay Terminal Loop Ramp Alternative**
**Location of Terminal Components**

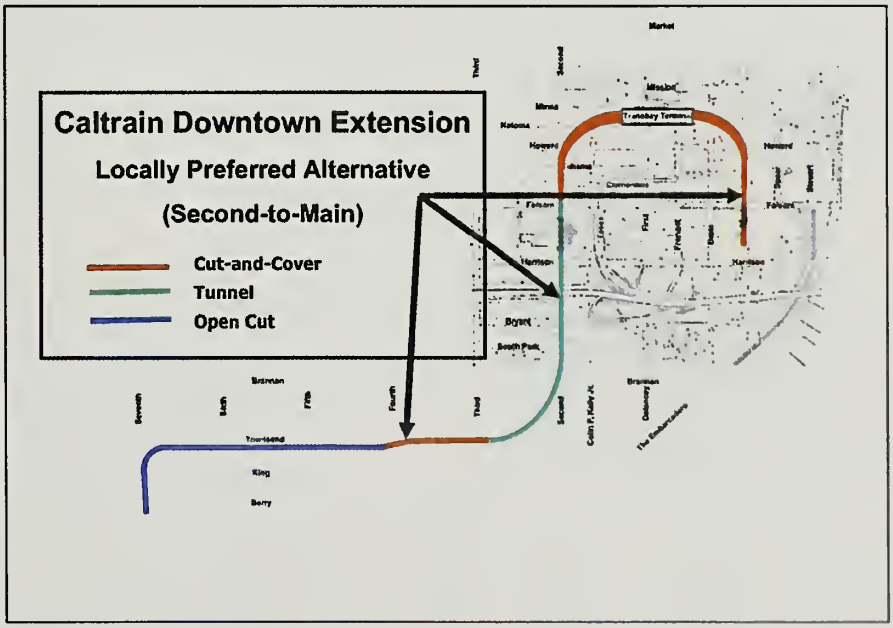
### S.2.2.3 Caltrain Downtown Extension Alternatives

The Caltrain Downtown Extension Component consists of an extension of Caltrain from the present San Francisco terminus at Fourth and Townsend Streets to an underground terminal on the site of the present San Francisco Transbay Terminal at First and Mission Streets, a distance of some 1.3 miles. The extension would include reconstruction of the current storage yard at Fourth and Townsend, with provision of three surface platforms and six tracks on the southern portion of the existing facility near Fourth and King Streets and the addition of a new underground Caltrain station on the northern portion near Townsend and Fourth Streets.

Caltrain Downtown Extension tracks would begin its descent at about Berry Street and would curve east to a new underground station with a center platform near Fourth and Townsend Streets. From there, the tracks would continue under Townsend Street near Fourth Street, and continue east under Townsend Street in a cut-and-cover tunnel configuration. It would then curve north at about Clarence Place just east of Third Street in a cut-and-cover configuration. Nine buildings would need to be acquired and demolished to accommodate cut-and-cover construction of the curve from Townsend to Second and Brannan Streets. *A tunneling option has been defined for the Caltrain Downtown Extension. Under this option, the extension would be constructed from near Townsend Street, under Second Street, north to Folsom Street using a stacked drift tunneling technique. The tunneling option was selected by the Transbay Joint Powers Authority as the Caltrain Downtown Extension component of the Locally Preferred Alternative.* The alignment would continue under Second Street to Howard Street.

Two alternatives are under consideration from Howard Street north: (1) Second-to-Main, and (2) Second-to-Mission. *Engineering for these alternatives has been refined since distribution of the Draft EIS/EIR. Platform lengths and the length of straight (tangent) platforms were increased for both options, and additional through tracks were added to both. The lengths and number of tail tracks were also increased under both options.*

**Second-to-Main Caltrain Extension Alternative.** As the alignment approaches Howard Street along Second Street, it would curve northeasterly, into the basement of the new Transbay Terminal. Eleven buildings would need to be acquired and demolished for this curve into the Terminal. The terminal station would have six tracks and three platforms and would include approximately 2,000 feet of additional tracks (called tail tracks) in a cut-and-cover section leading from the east end of the new Terminal. These tracks would curve south to Main Street and continue underneath Main Street to south of Folsom Street. The tail tacks could also be extended as a separate, independent project at some time in the future, to a San Francisco-to-Oakland cross-bay alignment for commuter rail and/or high-speed trains. *This Second-to-Main*



*Alternative was selected by the Transbay Joint Powers Authority as the Caltrain Downtown Extension component of the Locally Preferred Alternative.*

This alternative would include a design option for a pedestrian connection underneath Fremont Street to the BART Embarcadero Station.

**Second-to-Mission Caltrain Extension Alternative.** Up to Second and Howard Streets, this Alternative would follow the same alignment as the Second-to-Main Alternative, although it would have a deeper profile. At that point, it would provide a different configuration for the underground station in the Transbay Terminal and for the tail tracks leading out of the terminal.

As this alignment approaches Howard Street, rather than running parallel to the Terminal's long axis, this alignment would curve northeasterly at about Tehama Street, cutting diagonally under the new terminal and exiting out under Mission Street headed towards The Embarcadero. The southernmost track would branch into four tracks leading to and serving two center platforms directly under the Transbay Terminal.

The two northernmost tracks would continue on an angle to Mission Boulevard and would serve two 600-foot side platforms to the north of the Transbay Terminal. These two tracks would continue to two 1,400-foot tail tracks under Mission Street ending just east of The Embarcadero. Two additional buildings on Mission Street would need to be acquired north of the Terminal for this alternative. The tail tracks for this alignment would be used in a manner similar to the uses described above for the Second-to-Main Alternative.

This alternative also includes a design option for a pedestrian connection underneath Fremont Street to the BART Embarcadero Station.

### S.2.2.4 Proposed Transbay Redevelopment Plan Area

The Redevelopment Component includes two alternatives: the Full Build Alternative and the Reduced Scope Alternative. Either of these alternatives would include redevelopment on the parcels shown in Figure S-2. *In response to comments on the Draft EIS/EIR, the redevelopment area boundary shown on Figure S-2 has been revised from that shown in the Draft EIS/EIR.*

**Full Build Alternative.** This alternative assumes about 7.6 million square feet (sq. ft.) of residential/office/retail/hotel development, including approximately 5.6 million sq. ft. of residential development (4,700 residential units including affordable housing), 1.2 million sq. ft. of office development, 475,000 sq. ft. of hotel development, and 355,000 sq. ft. of retail development. *The Full Build Alternative was selected by the Transbay Joint Powers Authority as the redevelopment components of the Locally Preferred Alternative.*

A review of the proposals contained in the recently released Draft Transbay Redevelopment Project Area Design for Development Vision (San Francisco Redevelopment Agency, August 2003) shows that this vision would not introduce new adverse impacts beyond those identified in the Draft EIS/EIR for the Full Build Alternative for the redevelopment component of the Project.

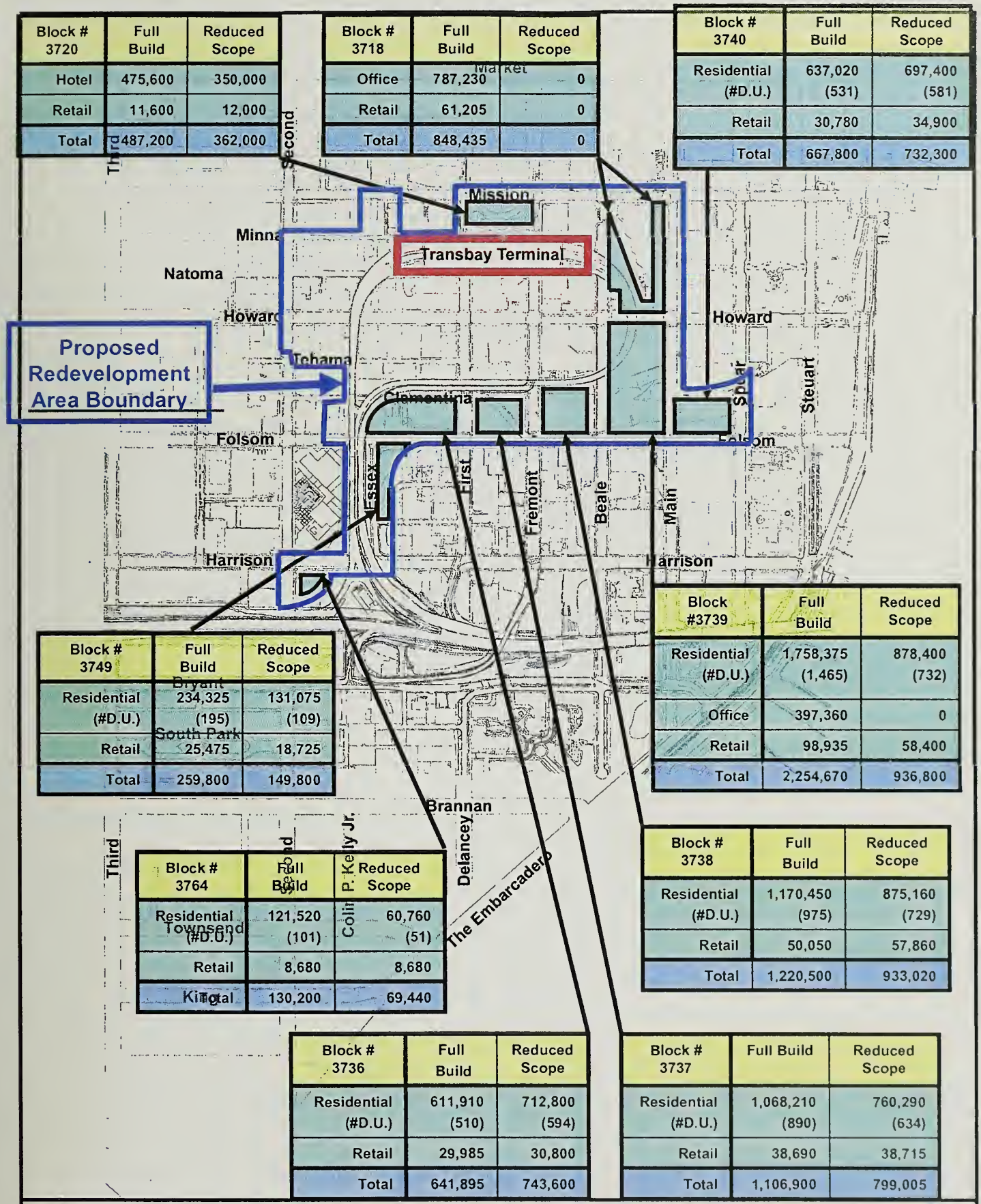



**Figure S-2: Development Levels Assumed for Full Build & Reduced Scope Redevelopment Alternatives & Proposed Redevelopment Area Boundary**

**Reduced Scope Alternative.** This alternative assumes a lesser amount of commercial and retail development and is weighted more toward housing. It assumes approximately 4.7 million sq. ft. of residential/office/retail/hotel development, including 4.1 million sq. ft. of residential (about 3,400 dwelling units), 350,000 sq. ft. of hotel development, and 260,000 sq. ft. of retail development. No office development is assumed for this Alternative.

## S.3 SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION MEASURES

Long-term environmental impacts and proposed mitigation measures are summarized in Table S-1. Short-term construction-related impacts and proposed mitigation are summarized in Table S-2. Because the Redevelopment Component of the project would involve separate future projects, each of which requiring separate environmental review, construction impacts for the Redevelopment Component are not included in Table S-2. For a full description of impacts and mitigation, see Chapter 5.

**Table S-1: Summary of Long-term Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT | | |
|---|---|---|---|---|
| | | TRANSBAY TERMINAL COMPONENT ALTERNATIVES | CALTRAIN DOWNTOWN EXTENSION COMPONENT ALTERNATIVES | REDEVELOPMENT COMPONENT ALTERNATIVES |
| **Land Use** | Opportunities for revitalization in Transbay area would be lesser than under either of Redevelopment Alternatives. | For both alternatives: Parking lot on Harrison Street between 2nd and 4th streets displaced by bus storage. Mitigation: construct a parking deck under the freeway between 3rd and 4th Streets. | For both alternatives (2nd Street Cut-and Cover Option): loss of historic buildings would result in some change in character. *More* buildings would remain under tunneling option | Full Build includes 7.6 million sq. ft. of development (5.6 million residential, 1.2 million office, 475,600 hotel, 355,400 retail). Reduced Scope includes 5.4 million sq. ft. of development (4.7 million residential, 350,000 hotel, 200,000 each office and retail). |
| **Wind** | No impact | No impact | No impact | Full Build: 9 exceedences of San Francisco Planning Code pedestrian comfort criterion and 1 hazard criterion exceedence. Reduced Scope: 8 pedestrian comfort criterion exceedences; 1 hazard criterion exceedence. Case-by-case mitigation for future redevelopment projects. |
| **Shadow** | No impact | No impact | No impact | For both alternatives: some publicly accessible, open spaces would be expected to see a diminution in sunlight during certain periods of the day and the year. No mitigation is indicated. |

**Table S-1: Summary of Long-term Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT | | |
|---|---|---|---|---|
| | | TRANSBAY TERMINAL COMPONENT ALTERNATIVES | CALTRAIN DOWNTOWN EXTENSION COMPONENT ALTERNATIVES | REDEVELOPMENT COMPONENT ALTERNATIVES |
| **Displacements and Relocation** | No impact | Both alternatives would take 4 buildings/displace 2 non-residential units, other currently vacant.<br>Mitigation would be relocation in accordance with the federal and state relocation acts. | 2nd-to-Main Alternative Cut-and-cover Option would displace 60 residential units (120 residents) & 48 businesses (1,084 employees).<br>2nd-to-Mission Alternative Cut-and-cover Option would displace 60 residential units (120 residents) & 58 businesses (1,422 employees).<br>Second-to-Main Tunneling Option would displace would displace 23 residential units (46 residents) & 40 businesses (425 employees).<br>Second-to-Mission Tunneling Option would displace would displace 23 residential units (46 residents) & 50 businesses (763 employees).<br>Mitigation: see Transbay Terminal discussion. | No impact. |
| **Socio-economics** | No impact | No adverse impact. Both alternatives would increase pedestrian activity and may contribute to the intensification of land uses and the redevelopment of underutilized parcels; thereby improving the economic vitality of the area. | No adverse impact. Both alternatives would provide improved access and therefore would enhance economic activity in this area. | No adverse impact. Both alternatives are expected to provide socioeconomic benefits by intensifying the urban character of the area and resulting in a more cohesive neighborhood with a balanced mix of residential and commercial uses. |

**Table S-1: Summary of Long-term Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT | | |
|---|---|---|---|---|
| | | TRANSBAY TERMINAL COMPONENT ALTERNATIVES | CALTRAIN DOWNTOWN EXTENSION COMPONENT ALTERNATIVES | REDEVELOPMENT COMPONENT ALTERNATIVES |
| **Community Facilities & Services** | No impact | Estimated 2 San Francisco Police Dept. officers would patrol new Terminal. *Additional officers and compensation would be required.*<br>Life safety plan would address fire safety issues.<br>Short- and long-term solid waste management measures are included. | For both alternatives, a life safety plan would be developed to address fire safety issues. | Estimated up to 115 San Francisco Police Dept. officers required/ no new police facilities.<br>Develop security plan for future projects.<br>Additional fire suppression personnel may be required/no new facilities likely.<br>New emergency medical staff may be required. Likely supported by user fees. |
| **Parklands, Schools and Churches** | No impact. | No adverse impacts. Current concept for the new Transbay Terminal includes an open plaza for public use. | No adverse impacts. Private schools would likely benefit from the improved transit operations. | No adverse impacts. *New parks proposed as part of redevelopment plan.* Private schools would likely benefit from new transit-oriented development. |

**Table S-1: Summary of Long-term Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT | | |
|---|---|---|---|---|
| | | TRANSBAY TERMINAL COMPONENT ALTERNATIVES | CALTRAIN DOWNTOWN EXTENSION COMPONENT ALTERNATIVES | REDEVELOPMENT COMPONENT ALTERNATIVES |
| **Fiscal and Economic Impacts** | No impact. | Both Alternatives: Net real estate acquisition, demolition, and relocation costs between *$34.6 and $47.0* million *(LPA – West Ramp).* | Second-to-Main Alternative Tunneling Option net real estate acquisition, demolition, and relocation costs between *$44.1 and $50.6* million *(LPA).*<br>Second-to-Mission Alternative Cut-and-Cover Option net real estate acquisition, demolition, and relocation costs between $130.4 and $137.6 million.<br>Second-to-Mission Alternative Tunneling Option net real estate acquisition, demolition, and relocation costs between $65.7 and $69.0 million.<br>Short-term loss of property tax revenue may be recouped or exceeded by new development.<br>Short-term loss of payroll tax revenue avoided if businesses relocate in San Francisco. | Transfer of publicly-owned property from State to San Francisco Redevelopment Agency and Transbay Joint Power Authority to defray portion new Transbay Terminal costs. |
| **Air Quality** | No impact. | *No violation of CAAQS for permanent bus storage facility. Current terminal design includes glass partition between bus passenger waiting and loading areas* | Both Alternatives expected to produce decrease in vehicle miles traveled (VMT) with reduction of emissions from automobiles (reactive organic gases, carbon monoxide (CO), oxides of nitrogen, particulate matter, and oxides of sulphur). | No adverse impact. Incremental increases in CO concentrations at study intersections would not exceed state or federal standards. Locating development at a transit hub expected to divert to public transit many trips that would otherwise be made by private automobile. |

**Table S-1: Summary of Long-term Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT | | |
|---|---|---|---|---|
| | | TRANSBAY TERMINAL COMPONENT ALTERNATIVES | CALTRAIN DOWNTOWN EXTENSION COMPONENT ALTERNATIVES | REDEVELOPMENT COMPONENT ALTERNATIVES |
| **Noise and Vibration** | No impact. | Noise impacts from proposed bus storage lot *west* of Second St. would occur *at residential uses near facility.* Mitigation: construct sound walls along south side of the bus storage lot*s and along bus ramps leading from AC Transit lot. Install absorptive materials on inside of noise walls. Sound insulate residential unit on Perry Street.* | Vibration impacts would occur at 4 buildings. Mitigation: use high-resilience track fasteners or a resiliently supported tie system. | No impact. |
| **Geology and Seismicity** | No impact | Included in discussion of Caltrain Downtown Extension impacts. | **Both Alternatives – Cut-and-cover & Tunneling Options**<br>Address potential for settlement by applying engineering principles and conventional construction techniques.<br>Address potential liquefaction and ground deformation through:<br>Regular track maintenance.<br>Design & construction of foundations & shoring systems.<br>Reinforce/stabilize soils, or rapid repair contingency plans.<br>Design for maximum credible earthquake; use seismically resistant building structures.<br>Pile supports for cut-and-cover portions, 4th & Townsend station. | Apply standard design and construction techniques for area. See Caltrain Extension discussion. |

**Table S-1: Summary of Long-term Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT | | |
|---|---|---|---|---|
| | | TRANSBAY TERMINAL COMPONENT ALTERNATIVES | CALTRAIN DOWNTOWN EXTENSION COMPONENT ALTERNATIVES | REDEVELOPMENT COMPONENT ALTERNATIVES |
| **Geology Seismicity** | | | **Both Alternatives – Tunneling Option** Due to fractured rock formations, use "Stacked Drift" and "Spiling" to prevent tunnel collapse. | |
| **Water Resources** | No Impact | No Impact | No Impact | No Impact |
| **Floodplain** | No Impact | No Impact | No Impact | No Impact |
| **Utilities** | No impact | Included in discussion of Caltrain Downtown Extension alternatives. | Relocation of existing underground utilities due to cut-and-cover excavation. Mitigation: coordinate with utility providers; avoid, relocate, and/or support in place utilities as necessary. Substantially reduced impacts from tunneling Option. | New development to connect to existing utility systems. |
| **Electric and Magnetic Fields (EMF)** | No impact | Included in discussion of Caltrain Downtown Extension alternatives. | EMF intensities and exposures are low. No health risks indicated. | No impact |

**Table S-1: Summary of Long-term Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT | | |
|---|---|---|---|---|
| | | TRANSBAY TERMINAL COMPONENT ALTERNATIVES | CALTRAIN DOWNTOWN EXTENSION COMPONENT ALTERNATIVES | REDEVELOPMENT COMPONENT ALTERNATIVES |
| **Historic and Cultural Resources** | No Impact | Archaeological resource impacts included in Caltrain Downtown Extension discussion.<br>Demolition and removal of the Transbay Terminal (*on the* National Register of Historic Places), as well as the existing loop ramp (contributing element to the Bay Bridge). Mitigation described under Caltrain Downtown Extension. | Previously unidentified archaeological sites may exist, and could be affected by any Alternative.<br>Mitigation: Archaeological Research Design and Treatment Plan.<br>Cut-and-cover Option (Both Alternatives) would require demolition of 13 buildings that contribute to historic districts. Mitigation measures to be set forth in a Memorandum of Agreement per Section 106 of National Historic Preservation Act.<br>Tunneling option (Both Alternatives) would require demolition of 3 buildings that are *either individually eligible for NRHP and* contribute to historic districts. *Demolition would isolate 3 buildings in historic district.* Mitigation measures set forth in a Memorandum of Agreement (MOA) per Section 106 of National Historic Preservation Act. | No Impact |
| **Hazardous Materials** | No Impact | No Impact | Construct and operate fueling facility to comply with local, state and Federal regulations; handle and store fuels and solvents per California OSHA and local standards for fire protection and prevention. | No Impact |

**Table S-1: Summary of Long-term Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT | | |
|---|---|---|---|---|
| | | TRANSBAY TERMINAL COMPONENT ALTERNATIVES | CALTRAIN DOWNTOWN EXTENSION COMPONENT ALTERNATIVES | REDEVELOPMENT COMPONENT ALTERNATIVES |
| **Visual/ Aesthetics** | Continued presence of existing features with low visual value, including surface parking lots, and in some cases, deteriorated buildings. | No adverse impact.<br>Bus ramps to the Bay Bridge would occupy less area than existing ramps, and would be split, breaking up the mass of the ramps, enhancing views. New ramp decks would be less visually intrusive than existing.<br>For West Ramp Alternative, the south and east portions of the existing ramp network would be demolished, opening up views outside of the Transbay Area. | Trench with concrete retaining walls approximately 30 feet deep south of Townsend St. and west of 5th St.<br>Cut-and-cover construction between 5th Street and the Transbay Terminal includes demolition of all existing buildings above the alternative alignments. It is anticipated that new buildings would be constructed, with height and bulk similar to those demolished. | *Under either alternative,* Folsom St. building heights would be taller than existing. Provisions for development would help protect views, preserve open space, *and* enhance the pedestrian environment.<br>*Under the Full Build Alternative, b*uildings may be broader and shorter, with setbacks preserved. *Under the Reduced Scope Alternative, buildings would be* taller and more slender preserving more of the existing views. |
| **Safety and Security** | No Impact | Security at Terminal responsibility of Transbay Terminal Joint Powers Authority. | Security at the Caltrain stations provided by the JPB via its contract with Amtrak. Security would increase over present levels commensurate with the increases in station activity. | Safety and security provided by San Francisco Police and Fire Departments. |
| **Energy** | No Impact | Included in Caltrain Downtown Extension discussion. | No adverse impact. Overall, Terminal and Train Extension would reduce the consumption of energy by diverting auto travel to rail and bus. | Redevelopment would require provision of energy from then current providers. |

**Table S-1: Summary of Long-term Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT | | |
|---|---|---|---|---|
| | | TRANSBAY TERMINAL COMPONENT ALTERNATIVES | CALTRAIN DOWNTOWN EXTENSION COMPONENT ALTERNATIVES | REDEVELOPMENT COMPONENT ALTERNATIVES |
| **Transit Operations** | 10,000 passenger Transbay terminal capacity<br>32 bus bays.<br>On-site bus storage | **For West Ramp Alternative**:<br>Increase terminal capacity to 35,000 passengers.<br>*48* bus bays provided.<br>Off-site bus storage.<br>**For Full Loop Ramp Alternative:**<br>Increase terminal capacity to *35,000* passengers.<br>Provide 51 bus bays.<br>Maintain *some* on-site bus storage *and use Off-site-bus storage*. | **Either Alternative would**<br>Increase linked transit trips in the corridor in 2020 by 10,000/day.<br>Result in daily travel time savings of 7,200 person hours.<br>Reduce VMT in Caltrain corridor by 260,000.<br>Reduce BART San Mateo County entries/exits, but increase BART-Caltrain transfers in San Francisco.<br>Reduce Muni and Samtrans service ($4 million annual savings)<br>Increase transfers between Caltrain and other transit service. | Either Alternative would provide high-density development (business and residential) near major multi-modal transit facility to encourage increased transit usage and defray portion of Transbay Terminal costs. Less transit-oriented development under Reduced Scope Alternative. |
| **Traffic Impacts** | No Impact | All project components included in the Redevelopment impact discussion. | All project components included in the Redevelopment impact discussion. | 7 intersections with adverse traffic impacts (significant under City and County of San Francisco guidelines)<br>Mitigation: The City may request developers to contribute to the new Integrated Transportation Management System (ITMS) program. |

**Table S-1: Summary of Long-term Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT | | |
|---|---|---|---|---|
| | | TRANSBAY TERMINAL COMPONENT ALTERNATIVES | CALTRAIN DOWNTOWN EXTENSION COMPONENT ALTERNATIVES | REDEVELOPMENT COMPONENT ALTERNATIVES |
| **Parking** | No Impact | All project components included in the Redevelopment discussion. | All project components included in the Redevelopment discussion. | Approximately 1,950 (14 percent of study area parking) off-street parking spaces would be eliminated, including 260 spaces within the current Transbay Terminal building. Development (business and residential) near major multi-modal transit facility expected to encourage increased transit usage with reduced parking demand. |
| **Non-motorized Traffic** | 11 corners and 2 crosswalks would operate at pedestrian Level of Service F. | All project components included in the Caltrain Downtown Extension impact discussion. | 11 corners and 2 crosswalks would operate at pedestrian Level of Service F. Although not required, pedestrian mitigation measures are suggested.<br>A total of *232* bicycle storage spaces would be needed at the new Transbay Terminal. | All project components included in the Caltrain Downtown Extension impact discussion. |

**Table S-2: Summary of Construction Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT |
|---|---|---|
| **Transit Operations** | No Impact | **For the Downtown Extension 2nd Street Cut-and-Cover Option**:<br>- Muni's Line 10 would be re-routed.<br>- Potential re-striping of 3rd Street could affect the performance of Muni Lines 15, 30, 45 and 81X. |
| **Vehicular Traffic** | No Impact | **Transbay Terminal** construction would affect access to 4 loading docks on Minna Street.<br><br>**Both Caltrain Alternatives - Cut-and-Cover Option** would require:<br>A total of *31* trucks per hour.<br>Block-by-block closures of 2nd St.<br>3rd Street would be restriped as detour with 3 northbound and 2 southbound lanes. On-street parking will be prohibited, and the bus lane will be a mixed flow lane.<br>A left-turn lane will be added on Howard at the 3rd/Howard intersection.<br>Temporary closure or alternative access for 21 driveways (2nd to Main Alternative), or 11 driveways (2nd to Mission Alternative).<br>The 2nd Street Tunneling Option would reduce the number of driveways affected.<br><br>**Tunneling Option for Caltrain Extension Alternatives** would require detour plans and parking removal only for the block of Second Street between Howard and Folsom Streets (Both Caltrain Extension Alternatives) and for Main Street between Howard and Harrison (Second-to-Main Alternative) or for Mission Street between Beale and The Embarcadero (for Second-to-Mission Alternative).<br><br>**Contra-flow lanes to the temporary terminal** would:<br>Eliminate 2 southbound traffic lanes & 12 curbside parking spaces on Beale Street between Howard and Folsom Streets.<br>Reduce Folsom Street from 4 to 2 lanes between *Essex* and Main streets. 9 parking spaces would be removed.<br>Main St. would be reduced from 3 to 2 lanes between Howard and Folsom. 48 motorcycle parking spaces & 9 automobile spaces would be removed.<br>On-street parking spaces on Howard St. would be removed between Beale and Main.<br>*Convert Essex northbound lanes to southbound lanes. Add a contraflow lane.* |

**Table S-2: Summary of Construction Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT |
|---|---|---|
| **Parking Impacts** | No Impact | **For both Downtown Extension alternatives (Cut-and-Cover Option)**, on-street parking would be temporarily removed along Townsend, 2nd, and 3rd streets. 2nd Street parking would be closed and re-opened on a block-by-block basis. Parking on 3rd Street would be removed to accommodate detour for 2nd Street traffic. Contractor would post dates and times of parking closures and openings.<br><br>**Tunneling Option for both Downtown Extension Alternatives.** Parking removal and detours would be required only for 2nd and 3rd Streets only between Folsom and Howard. Contractor would post dates and times of parking closures and openings. Tunneling Option would not require temporary removal of parking on 3rd Street. One block of parking on Second Street would be required between Folsom and Howard Streets. |
| **Pedestrians and Bicycle Traffic** | No Impact | **Temporary bus terminals would have the following impacts:**<br>Casual carpool queues on the east side of Beale Street would be temporarily relocated to the west side of Beale Street.<br>Walk and bicycle distances to the temporary terminal would be increased by 4 blocks for most pedestrians and bicyclists. |
| **Neighborhoods & Businesses** | No Impact | Most substantial impacts would occur on **streets affected by cut-and-cover construction**. Residential uses would be subject to reduced vehicle access, increased traffic congestion, increased noise, and construction-related dust. Businesses would experience the same type of disruptions, with the greatest impact to retail establishments, which rely on visibility and walk-in traffic.<br>**For Cut-and-Cover Options – Both Alternatives,** this includes Townsend, 2nd Street between Brannan and Streets.<br>**For Second-to-Main Alternative**, this includes Main Street.<br>**For Second-to-Mission Alternative**, this includes Mission Streets.<br>For Both Alternatives Tunneling Option, this includes Second Street between Folsom and Howard.<br><br>**Mitigation:** conduct outreach to affected residents and businesses; develop traffic management plan; maintain a field office and information telephone line; post informational signs; maintain sidewalks during construction where feasible; install construction decking flush with adjacent surfaces; install construction fencing. |
| **Community Facilities & Services** | No Impact | Safety & security services would be provided by San Francisco Police and other security personnel.<br>Any impacts to emergency access due to change in traffic conditions would likely be minor and not affect emergency response times.<br>The San Francisco Fire Department would review project plans to ensure provision of adequate life safety measures and emergency access during construction.<br>The amount of construction debris could be adequately accommodated by existing landfills.<br>Mitigation: construction specifications will require the use of recycled construction materials where feasible, and include specification regarding the recycling of construction and demolition debris. |

**Table S-2: Summary of Construction Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT |
|---|---|---|
| **Parks, Schools, Religions Institutions** | No Impact | For all alternatives/construction options: construction-related traffic delays may inconvenience persons gaining access to these facilities. |
| **Air Quality** | No Impact | **For all Alternatives and Options**:<br>Temporary emissions of nitrogen oxides, carbon monoxide, and sulfur oxides, and dust ($PM_{10}$).<br>**Mitigation** would include:<br>Water active construction areas at least twice daily.<br>Cover trucks hauling loose materials or require trucks to maintain 2 feet of freeboard.<br>Pave, apply water 3 times/day, or apply soil stabilizers on unpaved roads, parking and staging areas.<br>Sweep daily paved access roads, parking and staging areas.<br>Sweep streets daily if visible soil material is carried onto adjacent public streets.<br>Install sandbags or other erosion control measures.<br>Replant vegetation as quickly as possible. |
| **Noise & Vibration** | No Impact | **For all Alternatives and Options**, noise and vibration from construction activities could intrude on nearby residents and workers.<br>**Mitigation** would include:<br>Construct a sound wall as necessary for construction site.<br>Comply with San Francisco Noise Ordinance.<br>Conduct noise and vibration monitoring.<br>Conduct inspection and noise testing of equipment.<br>Implement community liaison program.<br>Include noise control requirements in construction specifications.<br>Limit use & hours of construction high vibration-generating techniques. |
| **Water Resources** | No Impact | **For all Alternatives and Options**:<br>Grading, tunneling, and utility excavations would increase the sediment load to storm sewers, and wind-transported soils could affect nearby surface waters.<br>Construction dewatering would locally result in temporary lowering of the water table and could promote downward migration of contaminants.<br>**Mitigation** would include:<br>Manage construction spoils to minimize wind dispersion.<br>Dewater in stages and discharge dewatered effluent to sanitary sewer.<br>Test groundwater samples to obtain a batch discharge permit from San Francisco Public Works Department; treat effluent prior to discharge if necessary. |

**Table S-2: Summary of Construction Impacts and Proposed Mitigation Measures**

| IMPACT CATEGORY | NO-PROJECT ALTERNATIVE | PROPOSED PROJECT |
|---|---|---|
| **Utilities** | No Impact | Impacts for overall project were addressed in prior table. If necessary, disruptions to service during construction would be short-term and carefully scheduled with advance notice given to affected customers. |
| **Electromagnetic Fields** | No Impact | No Impact |
| **Historical and Cultural Resources** | No Impact | Caltrain Extension Alternatives and Options require construction easement at the southeast corner of 166-178 Townsend Street, a contributor to the significance of the Rincon Point / South Beach Historic Warehouse – Industrial District.<br>Proposed **mitigation:** underpin the building prior to construction.<br>For archeology:<br>If buried cultural materials are unearthed during construction, work in the vicinity would be halted until a qualified archaeologist can assess significance. If human remains are encountered during construction, no further disturbance shall occur until the County Coroner has made the necessary findings.<br>Long-term impacts to archaeological and historical resources are addressed in Section 5.14. |
| **Hazardous Materials** | No Impact | Potential for direct impacts from pre-existing hazardous waste at 7 sites, indirect impacts from 27 sites.<br>Exposure to asbestos or lead could result from demolition of the Transbay Terminal, which may have asbestos containing materials (ACM) and/or lead-based paint.<br>**Mitigation** measures would include:<br>Conduct further site investigation and develop mitigation plan for disposal of contaminated soil and discharge of contaminated effluent.<br>Workers who may have contact with contaminated soil or groundwater would be required to have appropriate health and safety training.<br>A worker health and safety plan would be developed, implemented and monitored.<br>Any ACM and/or lead-based paint in the Terminal would be identified. If necessary asbestos will be abated and lead-based paint removed prior to demolition. |
| **Aesthetics/ Visual Impacts** | No Impact | Construction equipment and supplies would be visible, and evidence of construction activity would be noticeable to area residents, employees, and visitors.<br>**Mitigation** is not required, but the project contractor will minimize "spill over" light or glare effects on adjacent areas at night. The TJPA and JPB, through on-site field office, will make all efforts possible to minimize specific aesthetic and visual effects of construction identified by neighborhood businesses and residents. |
| **Geologic Impacts** | No Impact | **For both Downtown Extension Alternatives - Cut-and-Cover Option**, poor quality bedrock under Second Street from Brannan Street to Folsom Street would be addressed by special shoring techniques.<br>**For the both Downtown Extension Alternatives Tunneling Option**, specialized tunneling techniques are recommended including "spiling" and "stacked drift." |

| Table S-2: Summary of Construction Impacts and Proposed Mitigation Measures | | |
|---|---|---|
| **IMPACT CATEGORY** | **NO-PROJECT ALTERNATIVE** | **PROPOSED PROJECT** |
| **Safety and Security** | No Impact | To ensure safety during construction, best construction management practices would be required to be in place:<br>Construction and staging areas would be fenced and lighted.<br>Recognized safety practice requirements would be followed for the use of heavy equipment and the movement of construction materials.<br>The Construction Manager would be responsible for job site safety and security.<br>Emergency response personnel within San Francisco would be available for immediate response on an as-needed basis. |

## S.4 ESTIMATED CAPITAL COSTS

*The Locally Preferred Alternative for* the rebuilt Transbay Terminal and the underground Caltrain Extension *is* estimated to cost *$2.083 billion escalated to year of expenditure. Selection of another alternative other than the LPA would result in higher capital costs.* The Transbay Terminal component, *West Ramp Alternative,* of the Project is estimated to cost *$1,101.68 million escalated to year of expenditure. The Second-to-Main, tunneling Alternative for* the Caltrain Extension Alternative *is estimated to* cost *$971.84 million escalated to year of expenditure.*

Tables S-3 and S-4 summarize capital costs *for the Locally Preferred Alternative components of the* new Transbay Terminal and Caltrain Downtown Extension improvements, respectively. Cost estimates include net land acquisition costs and all agency costs for project oversight as well as general project contingency and reserve.

***Table S-3: Transbay Terminal Capital Cost Estimate***
***West Ramp Alternative (LPA)***
***(Millions of Dollars – Year of Expenditure)***

| *Activity* | *Cost Estimate* |
|---|---|
| *Operations Analysis, Preliminary Engineering, Geotechnical Engineering), Program Review/Value Engineering, Final Design & Permitting, Owner Costs* | *$107.87* |
| *Acquire Property, Design, Construct Temporary Terminals (Transit and Greyhound)* | *$28.29* |
| *Acquire Property & Demolish Buildings to Build Terminal* | *$36.54* |
| *Demolish Existing Terminal & Ramps, Construct New Terminal & Ramps* | *$909.22* |
| *Construct Permanent Off Site Bus Storage Facility* | *$24.45* |
| ***TOTAL COST ESTIMATE*** | ***$1,106.37*** |

*Notes:*

- *Costs escalated to year of anticipated expenditure between 2004 and 2011.*
- *Costs are for West Ramp Alternative*
- *Other qualifications and assumptions apply, including coordination with Caltrans during the retrofit of the Western Approach and bus ramp retrofit projects.*
- *Total assumes high end of 2001 real estate estimate escalated to year of expenditure.*
- *Construction costs include a 25% construction contingency, 8% for construction management, and 10% project reserve. Owner costs are factored into each category.*

***Source:*** *MTC, SMWM, Oppenheim/Lewis, Sedway Group, Parsons, 2003*

**Table S-4: Capital Cost Estimate for Caltrain Downtown Extension Second-to-Main Street Tunneling Option – Locally Preferred Alternative**
***(Millions of Dollars – Year of Expenditure)***

| *Activity* | *Cost Estimate* | |
|---|---|---|
| *Operations Analysis, Preliminary Engineering, Geotechnical Engineering, Program Review/ Value Engineering, Final Design & Permitting, Owner Costs* | | *$76.83* |
| *Acquire Property & Demolish Buildings along Extension* | | |
| *Acquisition/Relocation for Train Subway* | *$82.85* | |
| *Demolition* | *$1.24* | |
| *Resale Proceeds* | *($31.12)* | |
| *Subtotal* | | *$52.97* |
| *Design and Relocate Utility Lines along Extension* | | *$52.90* |
| *Construct Surface Rail & Improvements at Train Yard* | | *$13.37* |
| *Construct Cut-and-Cover and Retained-Cut – Caltrain Extension* | | *$427.13* |
| *Reconstruct Streets* | | *$7.09* |
| *Construct Train Tunnel* | | *$287.70* |
| *Construct Track & Systems Facilities* | | *$58.54* |
| ***TOTAL COST ESTIMATE – Caltrain Downtown Extension*** | | ***$976.53*** |

*Notes:*

- *Costs escalated to year of anticipated expenditure between 2004 and 2011.*
- *Costs are for Second-to-Main Tunneling Alternative, the Locally Preferred Alternative.*
- *Total assumes high end of 2001 real estate estimate escalated to year of expenditure.*
- *Construction costs include a 25% construction contingency, 8% for construction management, and 10% project reserve. Owner costs are factored into each category.*
- *The optional underground pedestrian connection from the train mezzanine to The Embarcadero Muni Metro/BART Station is estimated to cost $45.3 million.*
- *An additional $235 million could need to be added to the Project costs for purchase of dual mode locomotives if the Caltrain corridor is not electrified.*

***Source:*** *Parsons, 2003*

## S.5 PROJECT'S INCLUSION IN REGIONAL TRANSPORTATION PLAN

The Transbay Terminal / Caltrain Downtown Extension / Redevelopment Project is included as one of the top funding priorities in the financially constrained portion (called "Track 1") of the Regional Transit Expansion Policy (RTEP).1 The RTEP is the transit expansion element of the 2001 Regional Transportation Plan (RTP).

The 2001 RTP, including the RTEP, was adopted by the Metropolitan Transportation Commission in March 2002. The Transbay Terminal/Caltrain Downtown Extension/ Redevelopment Project is therefore included in the financially constrained 2001 RTP.

1 The Project is identified as the "Caltrain Downtown Extension/Rebuilt Transbay Terminal" in the RTEP and RTP.

*The 2003 Transportation Improvement Plan (TIP) was federally approved in February 2003. The proposed Project is included in the 2003 TIP for Preliminary Engineering and design.*

## S.6 PROPOSED FUNDING BY SOURCE

Table S-1 presents *a funding plan for the LPA that was adopted by the TJPA Board and* described in Chapter 2 *of this Final EIS/EIR.* These funding options are based on the funding plan developed jointly by the City and County of San Francisco, the San Francisco County Transportation Authority, the JPB, and MTC as part of MTC Resolution 3434. The financial plan in this *Final EIS/EIR* is based on financial projections and governmental actions that are not finalized.

*Table S-1 identifies revenue sources to fund the expected financing cost of the project. The other funding options have also been developed using Resolution 3434 funding plan as the point of departure, with adjustments as necessary within the framework of project eligibility and assumed overall availability of the different funding sources.*

All improvements to the Transbay Terminal/Extension project could be classified as Transportation Improvements under Title 23 and are therefore eligible for a subordinated loan from the federal government as a part of USDOT's TIFIA program, which was authorized in TEA-21. This program may provide various forms of credit support for large transportation projects for up to one-third of a project's total cost. Revenues that could be pledged to such a loan include:

- Tolls from the San Francisco Bay Bridge,
- Lease income on retail space within the terminal,
- Sale or lease of properties transferred to the Transbay Joint Powers Authority, and
- Tax Increment Revenues on project areas created by the San Francisco Redevelopment Agency.
- *Passenger facility fees.*

*While additional consideration could be given to the relative contribution of various funding sources to the project, to avoid speculation regarding the funding sources to be used and the viability of the financially constrained plan, the variations on the funding plan shown in Table S-1 are based on existing funding sources. There are, however, prospects for additional funding from new sources.*

**Table S-5: Project Estimated Capital Costs and Funding Sources**
(Millions of YOE Dollars)

| **Transbay Terminal** | **West Ramp** |
|---|---|
| **Caltrain Extension Alternative** | **Second-to-Main Tunnel Option** |
| **Capital Costs and TIFIA Debt Service** | |
| Total Capital | $2,082.9 |
| Debt Service | $1,857.2 |
| Total Cost | $3,940.1 |
| **Funding Source** | |
| *Local/State* | |
| Regional Measure 1 | $53.0 |
| RTIP [1] | $23.0 |
| San Mateo Sales Tax [2] | $27.0 |
| San Francisco Sales Tax Reauthorization [3] | $295.0 |
| AB1171 [*4*] | $150.0 |
| Land Sales [*5*] | $287.9 |
| Tax Increment [*6*] | $534.2 |
| Net Operating Revenues [*7*] | $140.2 |
| Bridge Toll Increase (SB 916) [*8*] | $150.0 |
| High Speed Rail Bonds [*9*] | $475.0 |
| Other [*10*] | $*182.5* |
| PFC [*11*] | $873.0 |
| Leveraged Lease Transaction [*12*] | $50.2 |
| *Federal* | |
| TIFIA Loan | $689.7 |
| Section 1601 [*13*] | $9.4 |
| **Total Funds** | **$3,940.1** |

**Notes:**

[1] Per MTC's RTP, which assumes $23 million in RTIP (Regional Transportation Improvement Program), STP (Surface Transportation Program), and CMAQ (Congestion Mitigation and Air Quality Improvement Program) funds.

[2] San Mateo County contribution (per MTC's RTP).

*[3] San Francisco County contribution per Expenditure Plan for the Reauthorization of the Local Sales Tax for Transportation, approved June 17, 2003, escalated to YOE $s. Approved by voters November 2003.*

[*4*] Per MTC's RTP. New Source of discretionary funds to MTC, pursuant to State law passed in October 2001 to complete the seismic retrofit of Bay Area bridges and related projects, consistent with Regional Measure 1.

[*5*] Per *valuation by CB Richard Ellis for San Francisco Redevelopment Agency, August 2003, escalated to year of expenditure.*

[*6*] Tax Increment amounts from Seifel Consulting, *August 8, 2003 for San Francisco Redevelopment Agency.*

[*7*] Per Jones, Lang LaSalle and Nancy Whelan Consulting, *September 2003.* Includes $3 million in annual BATA bridge toll operating support per MTC Resolution 3434 *and SB 916 (proposed).*

*[8] Regional Measure 2, which includes $150 million for the Project, was passed by the voters in Bay Area counties on March 2, 2004.*

[*9*] *Per SB 1856, funding for the Caltrain Downtown Extension may be provided as a part of the High Speed Rail bond initiative. The bond may be approved by the voters in November 2004.*

[*10*] Other includes potential funding from the following sources: Proposition 42, *federal earmarks* and *additional local sales tax.*

[*11*] A Passenger Facility Charge (PFC) is assumed for Caltrain, AC Transit *and High Speed Rail* passengers. The PCF would be *$0.75 for Caltrain passengers, $0.25 for AC Transit passengers and $3 for High Speed Rail passengers.*

[*12*] The Terminal Facility's value is assumed to be $1.003 or $1.163 billion and the net benefit rate to be 5%. Leveraged lease transactions are encouraged by the FTA as innovative financing mechanism.

[*13*] Per MTC's RTP, which assumes $9.37 million in Section 1601 design grant.

**Sources:** San Francisco County Transportation Authority, Seifel Consulting, Jones, Lang LaSalle, Openheim/Lewis, Peninsula Corridor Joint Powers Board, Sedway Group, Nancy Whelan Consulting, Parsons Transportation Group, 2001, 2002, *2003, and 2004.*

## S.7 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The West Ramp Transbay Terminal, Second-to-Main, Tunneling Option, Full Build is the environmentally superior alternative in that it:

- Fully meets the purpose and need for the project,
- Provides the most efficient transit service within the new terminal,
- Provides better views and opportunities for coordinated development in downtown San Francisco with fewer adverse land use impacts,
- Requires the least amount of property acquisition, including the fewest historic structures, therefore involving the fewest business and residential relocations,
- Provides dense transit oriented development near a multi-modal transit facility to help defray the costs (via tax-increment financing) for a multi-modal transit facility, thus encouraging increased transit use,
- Has the lowest level of construction impacts on properties along Second and Third Streets.

*This alternative was selected by the Transbay Joint Powers Authority as the Locally Preferred Alternative.*

## S.8 ISSUES TO BE RESOLVED

*Resolution is required regarding the ultimate disposition of California high-speed rail voter initiative that is pending on a future election ballot, as well as the future implementation of the Caltrain electrification program.*

# CHAPTER 1: PURPOSE AND NEED FOR THE PROJECT

## 1.1 PURPOSE

The primary purposes of the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project are to:

- Improve public access to bus and rail services;
- Modernize the Transbay Terminal and improve service;
- Reduce non-transit vehicle usage; and
- Alleviate blight and revitalize the Transbay Terminal area.

The project is needed because the present Transbay Terminal, which was built in 1939, does not meet current seismic safety or space utilization standards. The need to modernize the Transbay Terminal provides an opportunity to revitalize the surrounding area and to extend Caltrain service from its current terminus outside the downtown area into the San Francisco employment core.

Undertaking these project components would address the following associated needs:

- Provide a multi-modal transit facility that meets future transit needs;
- *Improve the Terminal as a place for passengers and the public to use and enjoy.*
- Alleviate conditions of blight in the Transbay Terminal Area;
- Revitalize the Transbay Terminal area with a more vibrant mix of land uses that includes both market-rate and affordable housing;
- Facilitate transit use by developing housing next to a major transit hub;
- Improve Caltrain service by providing direct access to downtown San Francisco;
- Enhance connectivity between Caltrain and other major transit systems;
- Enable direct access to downtown San Francisco for future intercity and/or high-speed rail service;
- Accommodate projected growth in travel demand in the San Jose – San Francisco corridor;
- Reduce traffic congestion on US Highway 101 and I-280 between San Jose and San Francisco and other routes;
- Reduce vehicle hours of delay on major freeways in the Peninsula corridor;
- Improve regional air quality by reducing auto emissions;
- Support local economic development goals; and
- Enhance accessibility to employment, retail, and entertainment opportunities.

The Metropolitan Transportation Commission (MTC), State of California, City and County of San Francisco, and area transit providers (AC Transit, Muni, Golden Gate, SamTrans, and JPB) have evaluated options for replacement of the 60-year-old Transbay Terminal facility, due to its

age, need for seismic upgrade, and inadequate facility layout. A properly designed, new terminal would improve space utilization, passenger circulation, signage, security, safety, and the overall transit-rider experience.

A multi-modal transportation facility would provide a centralized location for public and private bus (AC Transit, Muni, Golden Gate, Greyhound), paratransit, and rail (Caltrain) services in San Francisco's growing Financial District/South of Market Area and would enhance transit access for passengers arriving in and departing San Francisco. The extension of the Caltrain system from its current terminus at Fourth and Townsend Streets to a new Transbay Terminal at First and Mission Streets would improve access for residents and workers in San Francisco's high-density financial district and improve connections to other local and regional transit providers. Additionally, a multi-modal terminal facility and Caltrain extension would facilitate future expansion of regional express train service and implementation of statewide high-speed rail service.

A new, multi-modal transportation facility close to housing and major retail and commercial opportunities would increase transit ridership, thus reducing the number of non-transit vehicles traveling on area streets, highways, and bridges. Reduction in automobile vehicle miles of travel would result in reduced vehicular air emissions and an improvement in air quality.

## 1.2 NEED

The project location and vicinity are shown in Figure 1.2-1. This section discusses the existing deficiencies in the Transbay Terminal and its surrounding area and the other transportation problems that the proposed project will address. In identifying current and future needs in the Terminal vicinity and the Caltrain corridor that would be served by the Project, the following paragraphs also summarize past efforts that have been taken to address these needs.

### 1.2.1 PREVIOUS EFFORTS TO IDENTIFY AND ADDRESS DEFICIENCIES IN THE EXISTING TRANSBAY TERMINAL STRUCTURE AND OPPORTUNITIES FOR COORDINATING REDEVELOPMENT

A decade of planning preceded current efforts to identify replacement solutions for the Transbay Terminal, which does not meet modern seismic safety or space utilization standards. The present Transbay Terminal building, which extends across both Fremont and First Streets, the related loading areas in the "hump" and crescent areas above and fronting on Mission Street, and the loop ramps connecting to the Bay Bridge occupy a large site. Much of this area is underused, which has long generated interest in developing a more efficient transportation facility that would free land for other uses.

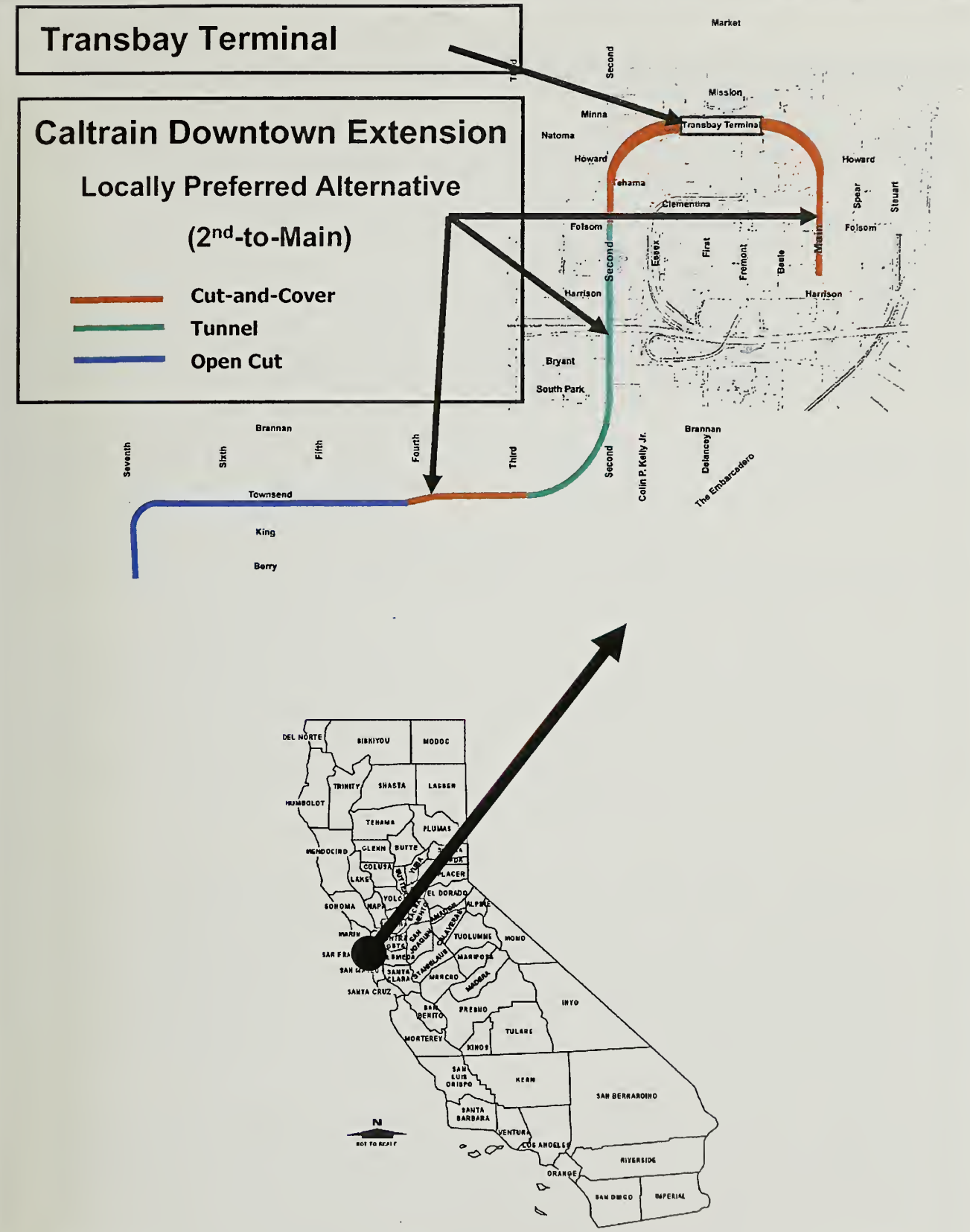



**Figure 1.2-1: Project Location and Vicinity Map**

The present terminal building does not meet current building or seismic safety codes, and the 1989 Loma Prieta earthquake raised seismic safety concerns about the terminal structure. Caltrans, as the Terminal owner and operator, reviewed the need for its seismic retrofit. As part of this effort, Caltrans determined that the access ramps to and from the Bay Bridge to the Terminal are seismically deficient and in need of repair or replacement.

In November 1992, Caltrans and the Office of the State Architect released alternative designs for improvements to the existing Terminal. In December 1992, the City of San Francisco and Caltrans agreed that, given the high estimated costs to bring the existing Terminal building to seismic and code compliance, it was reasonable also to consider its replacement.

In November 1993, Caltrans and the MTC – the transportation planning, financing, and coordinating agency for the nine-county Bay Area region – conducted a "Transit Needs Study" to identify operational needs for an upgraded or new facility (for example, numbers of bus bays, necessary space for bus operations and passenger facilities) while Caltrans proceeded with critical seismic and safety improvements. Based on the City and County of San Francisco Planning Department's October 1993 "Transit Terminal Study," preliminary alternatives were proposed in a City Planning Department Report to the Mayor.

In June 1994, the City and County of San Francisco and Caltrans agreed to undertake a study for alternatives to replace the Transbay Terminal. In December 1994, the San Francisco Board of Supervisors created the Transbay Redevelopment Survey Area to prepare a land use and transportation plan. During 1995 and 1996, terminal upgrade and replacement alternatives were studied by the San Francisco Redevelopment Agency and Planning Department, Caltrans, a Policy Advisory Committee representing the transit operators using the Transbay Terminal, a Citizens Advisory Committee, and a Technical Advisory Committee.

The Transit Terminal Decision Report (released in October 1995) yielded three primary options: (1) a new transit terminal on the site of the present Transbay Terminal, (2) a new terminal between Main and Beale Streets, south of the 201 Mission Street building and north of Folsom Street, and (3) a surface terminal at the Main/Beale site. On March 4, 1996, the San Francisco Board of Supervisors recommended the Main/Beale site (identified as Main/Beale North) as the City's preferred bus terminal alternative and recommended locating the proposed new Caltrain terminal underground at the site of the existing Transbay Terminal. The Board of Supervisors subsequently reversed this action, as discussed below at the end of this Section 1.2.1.

The September 1995 Transbay Terminal Reconfiguration Structural Analysis Report prepared for the Peninsula Corridor Joint Powers Board (JPB) in support of the 1997 Caltrain San Francisco Downtown Extension Project Conceptual Design Draft EIS/EIR considered whether the existing Transbay Terminal, retrofitted to withstand a maximum credible earthquake event, could accommodate a Caltrain Extension above-ground. This would avoid having to demolish the Terminal to construct the train box below ground level on the existing site. The structural analysis showed that the structure could be strengthened to take a new bus deck plus a train station and conform to the seismic provisions of the latest Uniform Building Code. Such a

strengthening would further limit space utilization within the Terminal, however, which would render the building impractical for multiple uses, including retail or commercial space. Following retrofit, commercial and passenger uses of the levels above the parking structure would be severely limited because the new shear walls would occupy substantial amounts of space, reducing the maximum size of the remaining rentable units and compromising pedestrian and customer flows. Given the costs and construction impacts of seismic retrofit, these limitations weighed against retrofit in comparison with the advantages of a new and more functional structure. Viewed from the perspective of the present study, seismic retrofit of the existing Terminal would not address the project purposes to modernize the Transbay Terminal, improve services, and revitalize the Terminal area.

In 1997, the City prepared a Draft Environmental Impact Report (EIR) for the Transbay Terminal Redevelopment Area Plan and construction of a new Transbay Terminal at the Main/Beale site. This project was terminated before the Draft EIR was circulated.

On January 1, 1998, MTC began operations as the Bay Area Toll Authority (BATA), created by the California Legislature to administer toll revenues on the Bay Area's seven state-owned toll bridges. In December of that year, BATA entered into a consultant contract to conduct the "Transbay Terminal Improvement Plan" study. A Transbay Panel working group was formed, consisting of public and private agencies and organizations that would be affected by the project. An Executive Committee was also formed, consisting of executive staff representatives and policy board members from AC Transit, the City and County of San Francisco, the JPB, Caltrans, and MTC. In February 1999, the San Francisco Board of Supervisors passed a resolution repealing its former endorsement of the Main/Beale site for a new terminal and urging the "City and County of San Francisco to work expeditiously with AC Transit, the MTC and Caltrans to retain AC Transit regional bus service at the current Transbay Terminal site."

The Transbay Terminal Improvement Plan study proceeded in two phases. Phase 1 identified terminal components and functional requirements to guide the development of design concepts for the new facility. This phase was completed in 1999. Phase 2 evaluated three terminal design concepts – named after Dickens novels – and BATA selected a concept (called "Great Expectations") to be carried forward for additional analysis. During 2000, refinements were made to the design concept to meet the needs of the transit operators that would use the new terminal, and project cost estimates and an implementation plan were developed. The "Great Expectations" concept is the basis for the Transbay Terminal West Ramp Alternative component of the proposed project (see Section 2.2.1.1). Another alternative evaluated by the Transbay Terminal Improvement Plan study, called "Our Mutual Friend," is the basis for the Transbay Terminal Loop Ramp Alternative component of the proposed project (see Section 2.2.1.2).

### 1.2.2 PROVIDING A MULTI-MODAL TRANSIT FACILITY THAT MEETS FUTURE TRANSIT NEEDS

A critical element in the Transbay Terminal Improvement Plan has been to ensure that design, construction, and operation of the new Transbay Terminal meet specific performance criteria to maximize the usefulness of the facility for transit operations. This need focuses on future (Year 2020) circulation, storage, loading, and passenger space requirements for AC Transit, Muni, Golden Gate, Greyhound, and paratransit services as well as a Caltrain and high-speed train station in downtown San Francisco. A new multi-modal transit facility on the site of the present Transbay Terminal would improve space utilization and improve operations for the various transit service providers.

#### 1.2.2.1 AC Transit

Estimates of current and future AC Transit ridership summarized in Transbay Terminal Improvement Plan Working Paper 3.5: Summary of Phase 1 Findings by the Transbay Panel (June 11, 1999) are presented in Table 1.2-1.

**Table 1.2-1: Estimates of Current and Future AC Transit Ridership**

| 1998 All-Day (Actual) | 1998 PM Peak Period (4:00-7:00) | 1998 PM Peak One Hour | 2020 All Day (Forecasts) | 2020 AM Peak One Hour (Forecasts) |
|---|---|---|---|---|
| 13,000 | 5,720 | 3,400 | 18,000 – 23,000 | 4,500 – 6,100 |
| Assuming: | 55% of daily total travel demand is eastbound, 45% westbound<br>44% transit growth 1990 – 2020<br>29.5% transit growth 1998 – 2020<br>80% of daily ridership occurs in the peak period<br>60% of peak period ridership occurs in the peak one hour | | | |
| Source: Transbay Terminal Improvement Plan Working Paper 3.5: Summary of Phase 1 Findings by the Transbay Panel (June 11, 1999) | | | | |

The lower end of the range for the projected 2020 ridership is based on the 1998 Regional Transportation Plan (RTP) EIR. Other estimates are higher. The San Francisco Bay Crossing Study (1991) projected AC Transit patronage levels would grow more rapidly and reach higher levels sooner than the RTP EIR forecasts. This study projected 2010 weekday ridership in the 18,000 to 21,000 range, which suggests peak one-hour ridership of 4,800 to 5,600. Even if growth between 2010 and 2020 were as low as one percent per year, weekday ridership could reach the 20,000 to 23,000 range, with peak hour/peak direction ridership in the range of 5,300 to 6,100 by 2020. This is almost twice current (1998) ridership levels. AC Transit's own study of potential Transbay service demand estimated 25 to 50 percent increases. Depending on the forecast method and assumptions, AC Transit's passenger-per-peak-hour ridership could be in the range of 4,500 to 6,100 by 2020.

It is the peak vehicle movements that define terminal space requirements. The Transbay Terminal Improvement Plan estimated that – even assuming higher bus loads (as a result of

improved schedules, marketing, and the use of higher capacity buses) – AC Transit could require 31 new stops within the terminal as opposed to the current 24 (or essentially the entire length of platforms two and three) to meet this level of future service. Increasing bus service also increases terminal or terminal area midday bus storage requirements. Accommodating AC Transit's space requirements in a new, multi-modal transit facility would ensure that AC Transit would be able to meet its future service needs to the horizon year.

#### 1.2.2.2 Muni

Currently, Muni buses and trolleys with one exception do not use the interior of the Transbay Terminal, but 11 Muni routes serve the Terminal, and four terminate there, one inside the terminal and three in the "hump" area on the north side between Fremont and First Streets. Bus stacking and queuing and conflicts with pedestrians are already problems during peak commute hours because this area is somewhat undersized for Muni's current operation. Traffic congestion on Fremont Street, which is a major off-ramp for Bay Bridge commuters, delays Muni in the morning peak; evening buses are delayed by queuing along First Street, which is a major on-ramp to the Bay Bridge. About 80 percent of current Muni riders who use the Transbay Terminal are transferring to other bus operations there (primarily AC Transit), while five percent transfer to another Muni line and the remaining 15 percent walk to their destinations, primarily in the Financial District.[1]

Muni has no plan to increase service to the Transbay Terminal, but a new Terminal that improves the circulation patterns for its routes could greatly facilitate current and future Muni service and improve intermodal connectivity. Also, Muni's needs would change dramatically if a new regional or intercity rail service, such as Caltrain, Amtrak intercity, and/or California High-Speed Rail were added to the terminal. These needs have not been documented, but estimates for as much as 50 percent more space for Muni operations have been cited.[2]

#### 1.2.2.3 Golden Gate Transit

Golden Gate Transit (operated by the Golden Gate Bridge, Highway, and Transportation District, GGBHTD) does not operate or seek to operate within the Transbay Terminal although it currently leases ramp bays as nighttime layover locations. The key issue with a new multi-modal transit facility for Golden Gate Transit is midday bus storage. Golden Gate currently stores 125 buses at Main / Folsom under a temporary lease with Caltrans; this lease terminates soon and Golden Gate needs to find alternative midday storage. Although Golden Gate does not plan to expand its services to the Transbay Terminal, its current and future operations are linked to the storage issue. Without a nearby location to store its buses in the midday, Golden Gate's San Francisco operations cannot increase and current operations are jeopardized. Providing storage

[1] Muni memorandum by John Katz, July 27, 1998, quoted in Transbay Terminal Improvement Plan Working Paper 3.5: *Summary of Phase 1 Findings by the Transbay Panel* (June 11, 1999).

[2] Ibid.

for Golden Gate buses in concert with the new terminal facility is a key component of the new terminal's functional requirements.

#### 1.2.2.4 Greyhound

Greyhound, a private bus company and package delivery service, has invested extensively in the current Transbay Terminal, making major tenant improvements to its bus deck area. In exchange, Greyhound was given a long-term lease with buy-back provisions that require its compensation if its space were made temporarily or permanently unavailable. Greyhound is the only operator in the Terminal with a long-term lease, with nearly 20 years remaining. Greyhound relocated to the Transbay Terminal from its former terminal on Sixth Street because of the regional transit connections offered. While it does not keep statistics, the carrier believes that many of its passengers travel to and from the Terminal area on other public transit services. Greyhound currently operates from an island on the second level bus deck and makes extensive use of the ramp structures from the freeway into the Terminal. Greyhound operates about 86 buses per day, with additional service during peak and holiday periods; approximately 100,000 annual passengers are served at Greyhound's Transbay Terminal location. The current bus island accommodates 13 over-the-road coaches in a parallel configuration. Greyhound does not store buses in the Terminal nor does it plan to increase its level of service but it *has* needs *for* added space to provide passenger amenities, including ticketing, waiting and retail areas. A new multi-modal transit terminal that improves space utilization for all operators would meet these needs.

#### 1.2.2.5 SamTrans

SamTrans provides connections to the Daly City and Colma BART stations, the San Francisco International Airport, and downtown San Francisco. Nine lines provide commute service between San Mateo County and the Transbay Terminal. Seven of these lines operate only during peak periods. SamTrans currently operates from the circular driveway at the front of the Transbay Terminal.

#### 1.2.2.6 Regional Paratransit

The Transbay Terminal is a connection point for several regional paratransit services, including East Bay Paratransit Consortium, SamTrans' Redi-Wheels, Golden Gate Transit's Whistlestop Wheels, and Muni's paratransit. Current numbers of riders are small, but all operators anticipate substantial increases in ridership that would require them to increase services to the Transbay Terminal. Operators have stated that paratransit demand may be depressed because the current facility is not fully accessible. A modern multi-modal transit facility that meets Americans with Disability Act (ADA) accessibility requirements in providing accessible pathways for connections between paratransit and fixed-route services would address this need.

### 1.2.3 Providing a More Vital Mix of Development in the Transbay Terminal Area to Address Underuse of Land

Like the current project, many of the previous efforts to upgrade or replace the existing Transbay Terminal have recognized the opportunity to improve the surrounding area at the same time. Use of the terminal and its surrounding area has fluctuated over the facility's 60-year life span, with increasing private automobile ownership and usage and the replacement of the "Key System" trains with transbay bus routes. The large footprint of the terminal building crossing Fremont and First Streets above-ground blocks views and makes underlying sidewalks and streets dark. The large, deteriorating building reduces the attractiveness of the adjoining area for development. The 1994 Transbay Redevelopment Survey Area, which included the Transbay Terminal and its associated ramp structures as well as vacant land left from demolition of the Terminal Separator Structure and the Embarcadero Freeway in the wake of the 1989 Loma Prieta earthquake, characterized the area as blighted.

Construction of either a joint transit terminal or transit facilities in close proximity to one another would serve the interests of both Caltrain and other regional transit riders, creating an intermodal transit hub in the area. The transit hub would concentrate a large transit user population into a confined area, thereby focusing potential economic and joint development opportunities. A more efficient functional terminal design would also support City urban design goals and provide for development of some of the surrounding properties to higher and better uses. Such coordination offers an opportunity to achieve integrated development of transportation facilities and other land uses in the project area.

The redevelopment component of the project focuses on the right mix of uses to revitalize the area, support the transit program, while adding significant amounts of housing to the South of Market area. Placing new housing close to an intermodal transit hub supports transit usage and reduces the potential for increased private auto use of area streets. Another major objective of the redevelopment component of the project is to generate sufficient revenue to substantially offset the costs of the new terminal. (See Section 2.2.3).

### 1.2.4 Closing the "Gap" – Addressing the Lack of Direct Caltrain Service into Downtown San Francisco

#### 1.2.4.1 Historical Support for the Extension of Caltrain into Downtown San Francisco

The underlying need for the Caltrain Downtown Extension component of the project relates to one central issue: getting the trains as close as possible to where most riders want to go. The concept of passenger train service directly into downtown San Francisco has been the subject of public scrutiny and debate for over a century. Currently, Caltrain's San Francisco service terminates at Fourth and Townsend Streets – over one mile from the downtown core. The distance between the Fourth and Townsend Streets station and most downtown San Francisco

job destinations is beyond walking distance for the majority of train riders and requires a transfer to the San Francisco Muni Metro light rail line or Muni bus service to complete the journey.

Figure 1.2-2 illustrates the one-mile "gap" that currently exists between major downtown San Francisco activity and employment centers and the present Caltrain terminus.

In 1987, the MTC identified an underground Caltrain extension to a station near the current Transbay Terminal site as "the single most important improvement that can be made to the Peninsula commuter line..."[3] Increases of over 125 percent in future Caltrain ridership to and from San Francisco have been forecast for such an extension (see Table 3.1-14). Work done for the Intercity High Speed Rail Commission, the predecessor to the current California High Speed Rail Authority, estimated a potential loss of 200,000 annual high-speed rail riders if the Caltrain terminal is not extended to the Transbay Terminal site (Charles River Associates, August 1996).

In March of 1997, the JPB and the Federal Transit Administration (FTA) released for public review a Draft Environmental Impact Statement / Draft Environmental Impact Report (Draft EIS/EIR) for the extension of Caltrain commuter rail from its Fourth and Townsend terminus in San Francisco to the site of the present Transbay Terminal. This Draft EIS/EIR reviewed a single "build" alternative with a train alignment along Seventh, Townsend, and Colin P. Kelly Streets and between Second and Essex Streets to the Transbay Terminal. It considered alignment options for the segment along Townsend Street and for the mined tunnel segment under Rincon Hill between Townsend and Folsom Streets. Although the Draft EIS/EIR was circulated and comments received, the environmental process did not proceed due to lack of sufficient funding for the project.

The voters of San Francisco have re-emphasized the critical importance of extending Caltrain service into the downtown core. Following certification of an initiative petition in December 1998, San Francisco voters in November 1999 approved Proposition H. This proposition provides that Caltrain should be extended from its present terminus at Fourth and Townsend Streets to the site of the present Transbay Terminal at First and Mission Streets. The proposition also states that the San Francisco Mayor, Board of Supervisors, and all city officers and agencies, including the Redevelopment Agency, "shall adopt such further ordinances and resolutions and take all other actions as necessary to effectuate the prompt extension of Caltrain downtown to said station." Proposition H also calls for no conflicting use or development of the Transbay Terminal site or of the proposed Caltrain extension right-of-way.

[3] MTC/JPB Interim Upgrade Study, 1987.

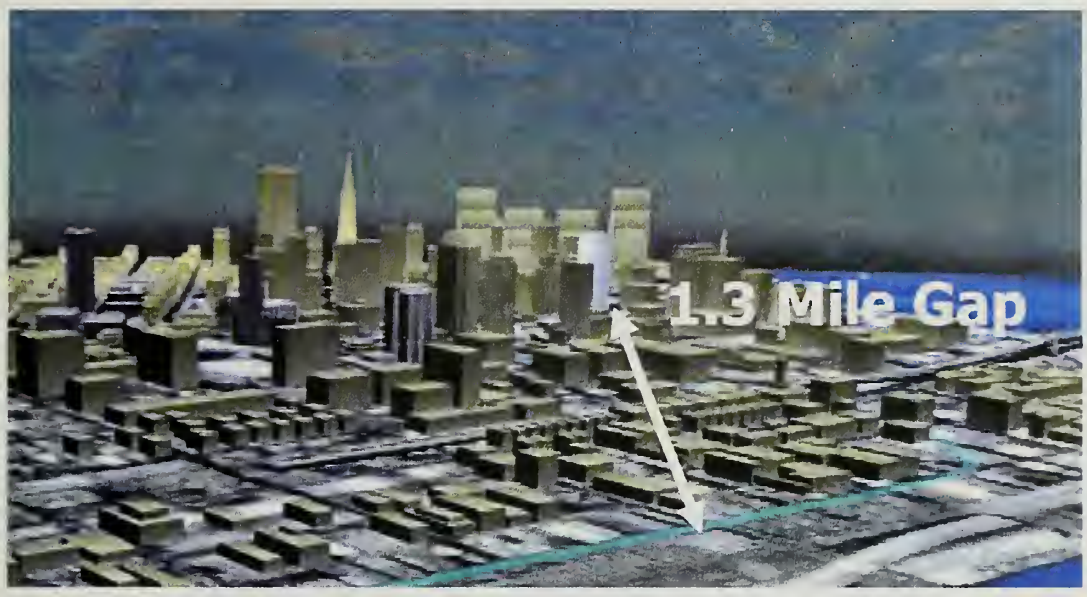



**Figure 1.2-2: Gap Between Downtown Activity Center and Caltrain Station**

### 1.2.4.2 Travel Delay Costs of Transfers from Caltrain Station to Downtown Employment Locations

The top twelve Caltrain origin-destination station pairs (by ridership volume) all include the Fourth and Townsend terminal as one major trip end. About 60 percent of the Caltrain riders disembarking at the Fourth and Townsend Streets station ride the Muni Metro or bus routes that connect the Caltrain terminus to downtown San Francisco employment centers. Most of these riders would be directly served, and their numbers increased, by eliminating the transit transfer link.

Based on the JPB's May 2000 Caltrain On-Board Survey, nearly half (49 percent) of the daily work trips emanating from any of the nine counties with destinations in the City of San Francisco were destined for the area typically identified as downtown San Francisco. As described above, the San Francisco Financial District and central downtown area (as well as the Civic Center area) are beyond walking distance from the Caltrain San Francisco terminus but accessible by Muni bus or Metro. The required transfer from one transit system to another adds to travel time and costs and discourages transit use.

Figure 1.2-3 illustrates existing typical morning peak period travel times by various transit modes between primary Peninsula origins and downtown San Francisco. For this study, the assumed point of origin is the downtown of each respective city and the California and Montgomery Streets intersection in downtown San Francisco.

The travel times include average delay or wait times required to transfer between modes (equal to one-half the time spacing -- or headway -- between scheduled bus or Caltrain and Muni train trips) in addition to the time spent in the transit vehicle and time required to reach the final destination.

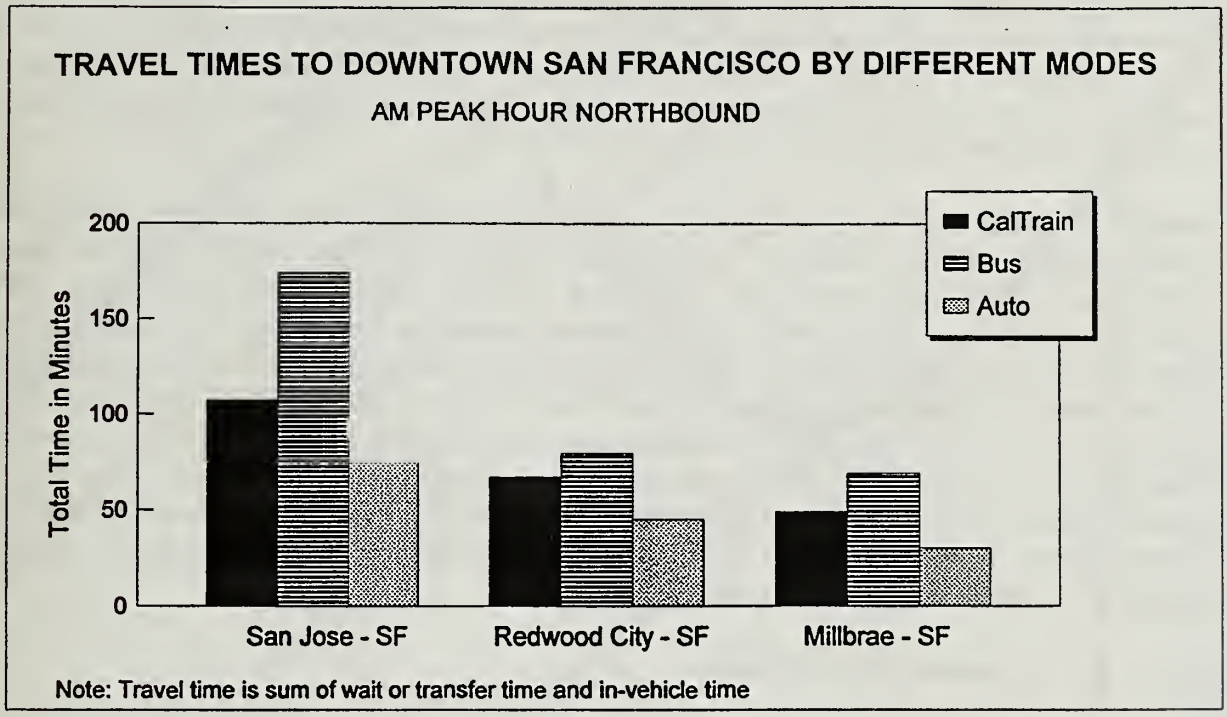
As Figure 1.2-3 shows, a trip from San Jose, Redwood City or Millbrae to downtown San Francisco remains highly competitive on Caltrain compared with SamTrans buses. Even with the additional several minutes transfer time between Caltrain and Muni at Fourth and Townsend, Caltrain is the faster mode. Compared to the auto, however, Caltrain is usually a longer trip. The auto provides almost door-to-door service, but the travel time is unpredictable due to possible congestion and/or traffic accidents. Reducing Caltrain travel time and inconvenience by eliminating the transfer at Fourth and Townsend would make the service more competitive with the auto and more reliable overall. Caltrain's increased reliability could offset much of its travel time disadvantage under typical conditions when compared to the auto.

Relocating Caltrain's San Francisco terminus to the Transbay Terminal area has been projected to result in a seven percent reduction in the number of person hours of auto travel.[4] Morning peak hour delay would be expected to be reduced by 20 percent. Implementation of the Caltrain Extension would result in daily travel time savings of 7,200 person hours, which includes 5,700 person hours saved for Caltrain riders and 1,500 person hours for roadway travelers in the corridor. Using FTA procedures, this represents an approximate $20 million per year savings (7,200 hours/day x $11.26/hour x 250 work days/year).

### 1.2.4.3 Negative Impact of Transfer on Potential Caltrain Ridership

Possibly the most significant "cost" of the intermodal transfer currently required at the Fourth and Townsend Station to reach downtown San Francisco is not the cost of added travel time but the adverse impact on Caltrain ridership. Over and above the travel time delay is the inconvenience of even well-coordinated transfers.

[4] August 27, 1996 memo from Korve Engineering to ICF Kaiser Engineers.




SOURCE: U.S. Census 1990

TRAVEL TIMES TO DOWNTOWN SAN FRANCISCO BY DIFFERENT MODES

Figure 1.2-3

According to research studies, passengers find transfers one of the most discomforting aspects of transit travel and regard them as "equivalent to three to four minutes of extra waiting time" in addition to the actual transfer time.[5] Passengers may be willing to pay double the base fare to avoid a transfer. Transfer elasticity studies of bus services have estimated that each additional transfer can lead to over a 50 percent decline in ridership.[6]

Transit users consider rail service more reliable and comfortable than bus services and therefore, the transfer impact could be somewhat greater for a commuter rail service. In any case, the rail-to-rail or rail-to-bus Caltrain-to-Muni transfer at the Fourth and Townsend Station can be assumed to depress San Francisco-bound Caltrain ridership by at least 50 percent below its potential with direct rail access to downtown San Francisco.

*With the* completion of the BART San Francisco Airport (SFO) Extension (see Section 1.4.1, BART Extension to San Francisco International Airport), riders *are* able to transfer between BART and Caltrain by crossing the platform at the new Millbrae intermodal station. This supplements Muni service for Peninsula commuters destined to/from San Francisco employment centroids along the BART corridor. Ridership projections conducted for this EIS/EIR show that not only would a substantial number of riders who would transfer to BART at Millbrae in the absence of a Caltrain Downtown Extension stay on Caltrain for their entire trip once the Extension is in place, but they also indicate a real increase in new Caltrain riders with the Caltrain Downtown Extension (see Section 3.1.6, Projected Caltrain Patronage and Accessibility Improvements). This demonstrates that there is a real benefit in removing the transfer "penalty" altogether as compared with adding new transfer options.

#### 1.2.4.4 Intermodal Connections

Transit operators in the nine-county Bay Area have developed routes and schedules to facilitate inter-operator connectivity. Numerous fare prepayment and pass arrangements are available among operators. Nonetheless, connections between Caltrain and other Bay Area transit operators are constrained by the distance between the Caltrain terminus at Fourth and Townsend Streets and most other downtown transit destinations. Figure 1.2-4 highlights the downtown station locations and pick-up/drop-off points of the major transit operators.

[5] Econometrics, Incorporated, Patronage Impacts of Changes in Transit Fares and Services, U.S. Department of Transportation, September 1980.

[6] Elasticity is an empirically derived or research-estimated measure comparing a change in behavior resulting from a change in a factor that influences behavior. In this case, it is the change in riders due to the change in number of transfers required (Econometrics, Incorporated).

Figure 1.2-4 | Intermodal Connections

Bus corridors are shown for Muni, AC Transit, Golden Gate Transit, and SamTrans routes that serve the downtown. At present, only Muni bus routes and the Muni Metro provide transit connections at the Caltrain terminal in San Francisco, with 20 Metro trains meeting all Caltrain trains arriving between 6:16 and 8:59 AM. Nine Muni bus routes also serve the Fourth and Townsend Caltrain station, including three commuter shuttles linking rail passengers with downtown destinations.

Muni also provides the only public transit connection between the Fourth and Townsend Caltrain Terminal and the Transbay Terminal, which is the primary drop-off/pick-up location for bus passengers using nearly all of the other area transit services: AC Transit, SamTrans, and Golden Gate Transit. Muni is also the only connecting transit link between Caltrain and the Ferry Building, which is the main access point for Marin, Solano, and Alameda County ferry services.

Currently, Muni Metro provides the only direct transit connection between Caltrain and BART, the major regional rail transit operator in the Bay Area, which links San Francisco to the East Bay and northern San Mateo County. Following completion of the BART San Francisco Airport (SFO) Extension, Peninsula riders will be able to transfer between BART and Caltrain by crossing the platform at the new Millbrae intermodal station. Amtrak buses serve San Francisco Caltrain passengers connecting with intercity Amtrak trains in Emeryville or Oakland in the East Bay. At San Jose, Caltrain meets most of the daily Capitol Corridor trains or buses to and from Sacramento, and three Caltrain trains connect with the Coast Starlight to Los Angeles.

*Compared with the existing Caltrain Station at 4th Street and Townsend, the proposed Caltrain Station at the Transbay Terminal will provide more convenient connections between Caltrain services and Muni, BART, AC Transit, Sam Trans, Golden Gate, and private carriers. The station will also allow Caltrain passengers from the Peninsula to reach downtown without transferring to other modes of travel.*

See Section 3.1 for a detailed discussion of current transit services in the project vicinity and to and from the Caltrain Terminal.

### 1.2.4.5 Accommodating Future High Speed Rail

The preamble to Proposition H notes that the California High Speed Rail Commission identified San Francisco as the preferred destination for a bullet train from Los Angeles to the Bay Area. The preamble goes on to state that:

> ". . . .as part of the extension of Caltrain downtown, a new or rebuilt terminal shall be constructed on the present site of the Transbay Transit Terminal serving Caltrain, regional and intercity bus lines, MUNI, and high speed rail, and having a convenient connection to BART and MUNI Metro." (emphasis added)

In June 2000, the California High Speed Rail Authority issued its Final Business Plan for Building a High-Speed Train System for California. This document recommends that the

Governor and state legislature initiate a state-level program EIR and federal-level EIS for a statewide high-speed train network. Alignments for Bay Area access presented in this document include the Caltrain corridor. The Business Plan states that terminating the high-speed trains at the Transbay Terminal in San Francisco should be included in environmental studies.

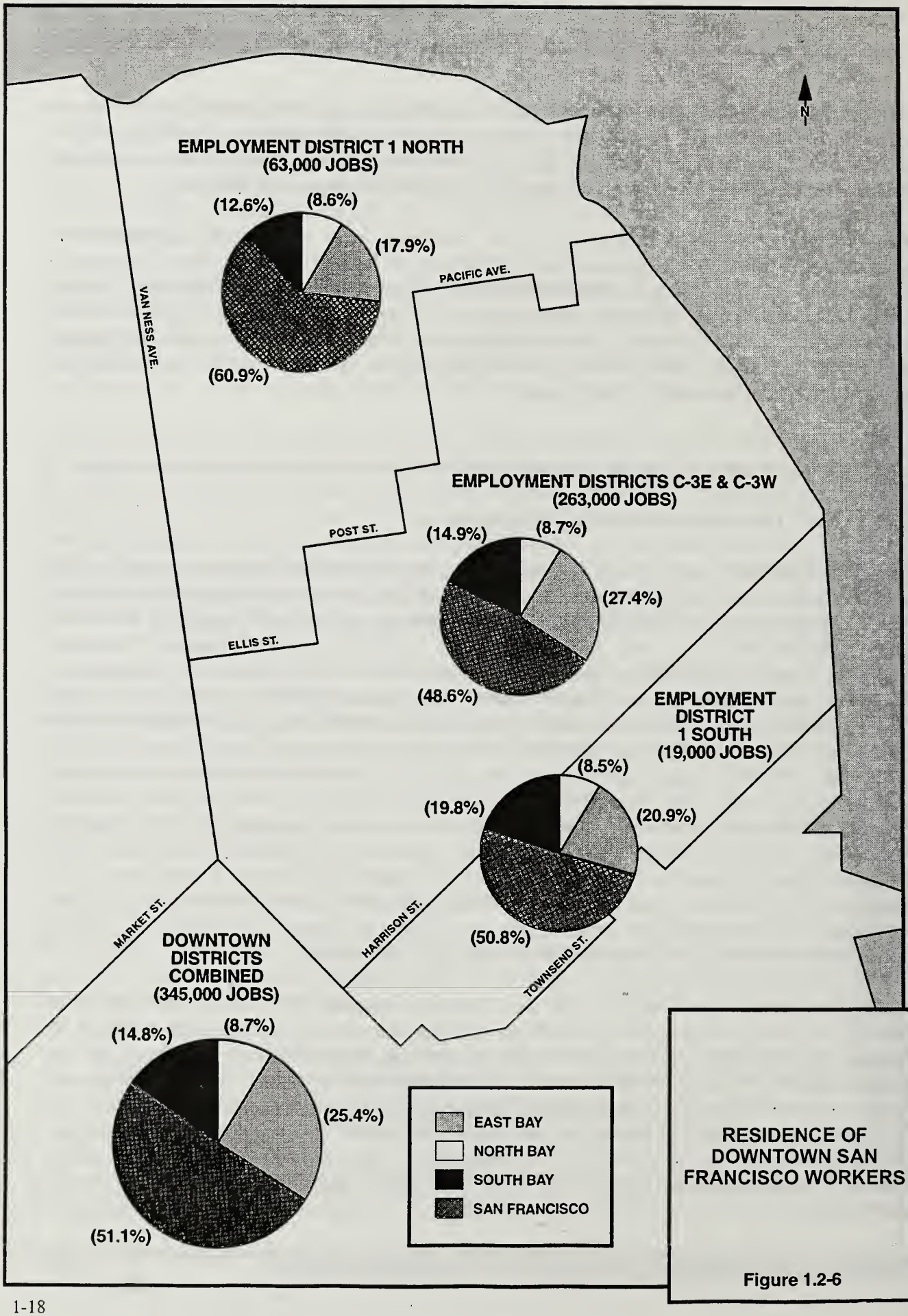
The JPB and the City and County of San Francisco have subsequently evaluated the compatibility of Caltrain track geometry and platforms with future high-speed trains. As a result of this analysis, new Caltrain downtown extension alignments have been identified for this EIS/EIR, as described in Chapter 2. These alignments have a track geometry (e.g., curve radii) that would enable high-speed train equipment that is currently in use in Europe and Japan to use the Caltrain downtown extension tracks, with high-speed train platforms in the basement of the new Transbay Terminal (see Section 2.2.2.4).

### 1.2.5 Current and Future Transportation Demand in the Caltrain Service Area

#### 1.2.5.1 Current Downtown Area Employment

Figure 1.2-5 provides a comparison of Year 2000 employment in San Francisco by district. The seven districts shown are based upon major travel analysis zones that the Association of Bay Area Governments (ABAG) and the MTC have adopted for projecting demographic and travel data. Data for the Year 1990, as reported in the 1997 Caltrain San Francisco Downtown Extension Draft EIS/EIR, show the San Francisco CBD containing nearly 60 percent of downtown area employment, and the downtown area accounted for 60 percent of total San Francisco employment. More recent data indicate a shift in San Francisco employment from the CBD to the South of Market area. San Francisco downtown areas included in districts 1-N, 1-S, C-3E and C-3W (See Figure 1.2-5) encompass nearly all "downtown" work locations for the purposes of this study. The area extends from the San Francisco Bay west to South Van Ness Avenue and south to Townsend Street. The downtown area also contains the Union Square, Market Street Downtown Retail, and Embarcadero Center shopping districts. According to San Francisco Planning Department, the downtown area provided approximately 321,000 jobs, or 51 percent of San Francisco's total employment in the Year 2000. Nearly one-third of these jobs were located in the district C-3E portion of the area, as shown in Figure 1.2-5. The C-3E District largely encompasses what is commonly referred to as the City's CBD.

During the decade from 1980 to 1990, San Francisco experienced a 5.4 percent increase in employment while San Mateo and Santa Clara counties each experienced increases of almost 23 percent. In 1990, Santa Clara County, with its fast-growing, high-technology companies, had the greatest number of jobs in the Bay Area, compared with other counties. This regional growth emphasizes the fast-growing, two-directional nature of corridor travel demand and the potential for Caltrain to serve both of these travel markets. These trends have become more pronounced during the decade from 1990 to 2000. For example, in February 2000, morning peak period Caltrain ridership (that is, before 9:00 AM) was 60 percent northbound and 40 percent southbound.




**RESIDENCE OF DOWNTOWN SAN FRANCISCO WORKERS**

**Figure 1.2-6**

### 1.2.5.2 Characteristics of Journeys to Downtown San Francisco Employment

The 1990 U.S. Census journey-to-work data indicate that the largest proportion (54 percent) of San Francisco employees live in San Francisco, and that this group has the highest transit mode share for travel to work (54 percent). Of the 482,700 reported daily work trips to the downtown (there are more work trips to or from the downtown than the number of employees due to multiple trips by employees, deliveries, visiting workers, etc.), just over 50 percent emanate from elsewhere in San Francisco, about 26 percent come from the East Bay, and 14 percent come from the South Bay (San Mateo and Santa Clara counties). Figure 1.2-6 presents the worker place of residence breakdown for each downtown employment district and for the four downtown districts combined.

According to "Commute Patterns to Downtown San Francisco," a memorandum to the Transbay Study Technical Advisory Committee from the San Francisco Planning Department (Badiner, 6/30/95), the overall mode split for journeys to work in downtown San Francisco was 54 percent transit, 30 percent drive alone, and 16 percent ride share. San Francisco-originating work trips had the highest transit mode share (61 percent transit) of all Bay Area residence regions. Commuters from the East Bay were next with a 55 percent transit mode share. San Francisco-destined commuters from the South Bay had the highest drive alone mode share (44 percent), and the lowest transit mode share (37 percent) compared with commuters from the other primary regions. This modal split was assumed as the baseline for current conditions. Caltrain ridership projections were developed from current ridership defined by on-board surveys in February 2001, with future (2020) mode splits estimated from adjustments to the previous Caltrain ridership study (Korve, 1996).

This modal split information reflects the superiority of high-quality, high-capacity, direct transit access to downtown San Francisco for San Francisco and East Bay residents relative to that afforded South Bay residents. Relocating the Caltrain Terminal closer to downtown would improve transit accessibility and result in substantially increased transit ridership for San Francisco-bound commuters from the Peninsula and South Bay. Figure 1.2-7 shows the major destinations by zip code area of northbound Caltrain commuters. The CBD centered along Market Street (zip code zones 94104, 94105, and 94111) dominates with 58 percent of all destinations. The highest proportion of Caltrain rider destinations (22 percent) is within the 94105 area containing the Transbay Terminal site.

Relocating the Caltrain terminus to the current Transbay Terminal site would not only better serve the San Francisco CBD, it would also improve accessibility to Santa Clara County's "Silicon Valley" jobs for San Francisco residents by offering better transit connections within the downtown core and better access for the area's expanding residential population. The high transit mode share among San Francisco residents highlights the potential for the extended Caltrain to capture San Francisco riders "reverse commuting" to South Bay jobs.

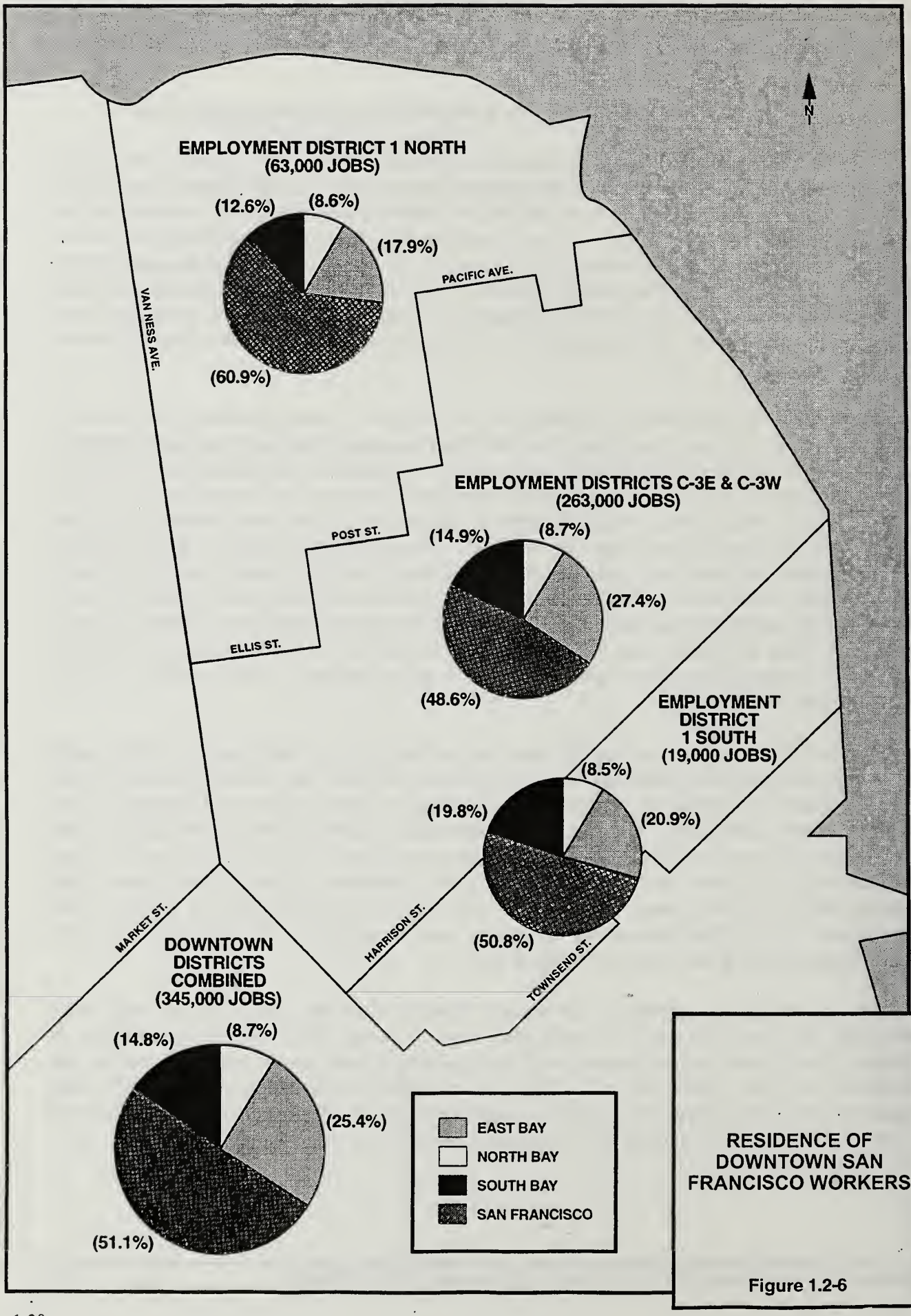

N
EMPLOYMENT DISTRICT 1 NORTH
(63,000 JOBS)
(12.6%)
(8.6%)
(17.9%)
(60.9%)
VAN NESS AVE.
PACIFIC AVE.
EMPLOYMENT DISTRICTS C-3E & C-3W
(263,000 JOBS)
POST ST.
ELLIS ST.
(14.9%)
(8.7%)
(27.4%)
(48.6%)
EMPLOYMENT
DISTRICT
1 SOUTH
(19,000 JOBS)
(8.5%)
(19.8%)
(20.9%)
(50.8%)
HARRISON ST.
TOWNSEND ST.
MARKET ST.
DOWNTOWN
DISTRICTS
COMBINED
(345,000 JOBS)
(14.8%)
(8.7%)
(25.4%)
(51.1%)
EAST BAY
NORTH BAY
SOUTH BAY
SAN FRANCISCO
RESIDENCE OF
DOWNTOWN SAN
FRANCISCO WORKERS

Figure 1.2-6

### 1.2.5.3 Future Downtown Area Employment and Travel Demand

Based on San Francisco Planning Department data, employment is expected to continue to grow by nearly 16 percent during the next 20 years, but anticipated growth is concentrated in a few areas. District 3, which covers the area east of Twin Peaks and south of Townsend Street to the County line (See Figure 1.2-5) – and which is beyond the "downtown" area identified for this study – was projected to experience an increase in employment of about 30 percent. These changes will shift the balance of downtown San Francisco employment concentration somewhat southward, although the CBD will retain its lead in all City employment. As of 2000, the CBD (District C-3E) contained about 30 percent of all employment citywide. The San Francisco Planning Department anticipates that by 2020, this area will contain about 27 percent of citywide employment. In contrast, areas to the south (Districts 1-S and 3) will increase their share of citywide employment by almost four percent, from 37 percent to over 40.4 percent, as a result of adding over 62,000 jobs in this 20-year period.

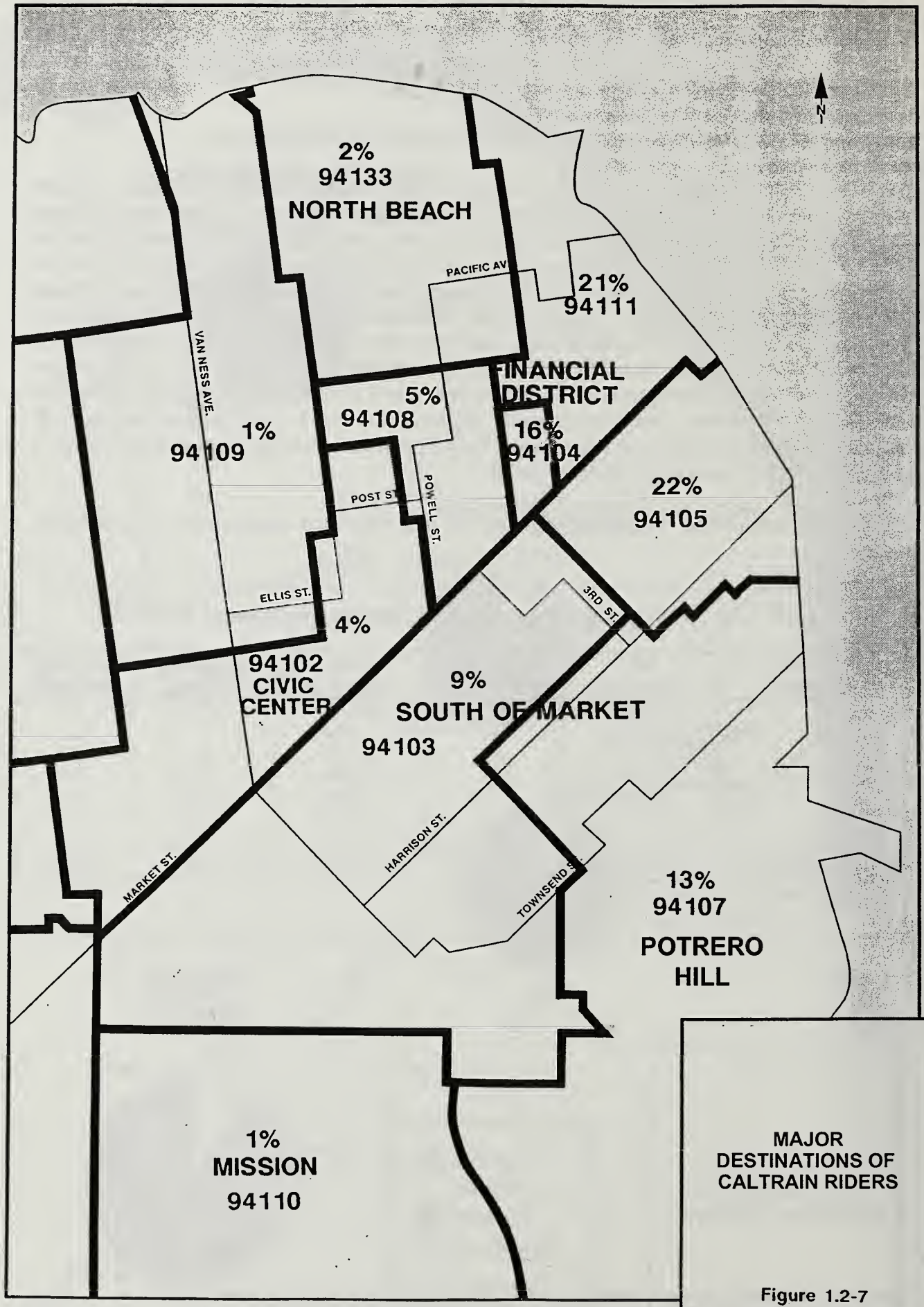
Table 1.2-2 summarizes anticipated changes in San Francisco employment by workplace location.

**Table 1.2-2: Anticipated Changes in San Francisco Employment by District**

| District Workplace[1] | 2000 Employment | Percentage of Total | 2020 Employment | Percentage of Total | % Change 2000-2020 |
|---|---|---|---|---|---|
| C-3 East | 187,082 | 29.7 | 198,170 | 27.1 | 5.9 |
| C-3 West | 45,968 | 7.3 | 52,194 | 7.1 | 13.5 |
| 1-North | 55,915 | 8.9 | 61939 | 8.5 | 10.8 |
| 1-South | 32,040 | 5.1 | 34,380 | 4.7 | 7.3 |
| 2 | 86,004 | 13.7 | 99,729 | 13.6 | 16.0 |
| 3 | 201,276 | 32.0 | 261,524 | 35.7 | 29.9 |
| San Francisco Total | 628,860 | 100.0% | 731,659 | 100.0% | 16.3% |

[1] Districts numbers and boundaries shown on Figure 1.2-5

Source: San Francisco Planning Department, 2001.




**MAJOR DESTINATIONS OF CALTRAIN RIDERS**

**Figure 1.2-7**

### 1.2.6 Current and Future Roadway Congestion

Economic growth and the corresponding demand for transportation services in the San Francisco Bay Area have exceeded the region's ability to increase roadway capacity. Existing demand for north-south travel along the Peninsula via U.S. 101 and I-280 regularly exceeds existing highway capacities and results in congestion that is increasing in both frequency and duration. Currently, U.S. 101 is the most severely congested freeway through the corridor (Transactions, MTC, August 2001). Between San Francisco and San Jose a number of roadway segments are at or over capacity during the peak commute hour.

Segments considerably over capacity during the evening peak include the area between I-80 and the I-280 / U.S. 101 interchange in San Francisco; south of Broadway Avenue in Burlingame to just north of the San Mateo Bridge in San Mateo; the areas north of the State Route 84 and State Route 237 interchanges in Woodside and Santa Clara, respectively; and the area from the San Tomas Expressway to the Capitol Expressway interchange in San Jose. Other segments of the roadway are approaching capacity. No roadway segment in the peak direction (generally southbound in the evening peak and northbound in the morning peak) operates better than level of service (LOS) D during the peak hour, with the majority of segments at LOS E or F. In the non-peak direction, only two short segments near the I-880 interchange and the San Mateo Bridge have been observed to operate on average at LOS C or better. (See Table 1.2-3 for definitions of freeway levels of service.)

**Table 1.2-3: Level of Service Criteria for Freeways[1]**

| Level of Service | Description | Volume/Capacity Ratio & Speed |
|---|---|---|
| A | Free-flow conditions with a high level of maneuverability. | 0.00 to 0.30<br>65 mph |
| B | Free-flow conditions but presence of other vehicles is noticeable. Minor disruptions easily absorbed. | 0.30 to 0.47<br>65 mph |
| C | Minor disruptions cause significant local deterioration. | 0.47 to 0.70<br>64 mph |
| D | Borders on unstable flow with ability to maneuver severely restricted due to congestion. | 0.70 to 0.89<br>61 mph |
| E | Conditions at or near capacity. Disruptions cannot be dissipated and cause queues to form. | 0.89 to 1.00<br>53 mph |
| F | Forced or breakdown flow with queues forming at locations where demand exceeds capacity. | Greater than 1.00<br>Variable |

Note: [1] Based on a design speed of 65 miles per hour.

Source: Transportation Research Board, Highway Capacity Manual, Special Report 209 (Washington, D.C., 1994), p. 3-9

Without future roadway improvements, congestion on corridor freeways is bound to worsen to the point where travel is diverted and the peak periods spread into the midday and to later in the evening. Bottlenecks will constrain movement through the corridor. MTC's travel projections

for the Peninsula corridor, based on the planned future transit (no Caltrain extension) and highway capacities for the year 2005, indicate that northbound morning peak-hour vehicle demand at the U.S. 101 / I-280 interchange in San Francisco would be approximately 22,000 vehicles, exceeding the existing interchange capacity by 57 percent. These high levels of congestion will take a toll on economic development by constraining goods and people movements.

Opportunities to improve highway capacity are constrained by a number of factors, including the need for extensive and costly right-of-way acquisitions and potentially significant environmental impacts, such as displacements of residences, businesses, and natural resources. For these reasons, substantial capacity improvements to U.S. 101 and I-280 cannot be assumed to address long-term travel demands in the corridor, and Caltrain provides a vital transportation alternative to costly highway capacity expansion. By increasing transit ridership, the Caltrain Downtown Extension would ease congestion on Peninsula freeways.

### 1.2.7 Future Parking Demand in Downtown San Francisco

A shift in corridor travel from auto to transit with an extension of Caltrain service would reduce parking demand in downtown San Francisco. An estimated 2,000 fewer parking spaces would be required in the area based on the projected increase in Caltrain ridership directly attributable to the Caltrain Extension. This reduction in demand would offset most of the existing parking loss attributable to the project (see Chapters 5). Less parking-related traffic would reduce congestion on local streets. The reduction in parking demand and supply attributable to the Caltrain Extension supports City of San Francisco General Plan objectives to reduce the need for parking in downtown San Francisco and elsewhere.

### 1.2.8 Corridor Travel and Air Quality

High rates of auto ownership and vehicle miles of travel have contributed to air quality problems throughout California. Several of the pollutants of concern include ozone, nitrogen oxides and sulfur dioxides (precursors of smog); carbon monoxide; and particulate matter.

The San Francisco Bay Area's air quality has improved in recent years, largely in response to technological improvements in motor vehicles and less polluting fuels. The project study area is within the Bay Area Air Basin (BAAB), for which air quality conditions are monitored by the Bay Area Air Quality Management District (BAAQMD). According to the BAAQMD, the BAAB is in attainment with national standards for carbon monoxide (CO), nitrogen oxides ($NO_x$), sulfur dioxide ($SO_x$), and annual particulate matter ($PM_{10}$). It is designated non-attainment for ozone ($O_3$) and unclassified for $PM_{2.5}$ and 24-hour $PM_{10}$. With respect to California standards, the BAAB has attainment status for CO, $NO_x$, and $SO_x$. It is designated non-attainment for $O_3$ and $PM_{10}$.

Because transportation is the major contributor to $O_3$, increasing auto travel threatens the area's improvement in air quality. Growing congestion will add to the potential problems because of increased emissions of vehicles operating in stop-and-go traffic. Shifting commuters and other travelers to higher occupancy modes is highly desirable to restrain the growth in auto travel. A new multi-modal transit facility in the heart of San Francisco's employment center will serve this goal. Developing a transit-oriented mix of land uses in the vicinity of that multi-modal facility also supports this objective. Improved Caltrain service offers the greatest potential for increased high occupancy travel along the San Francisco Peninsula, particularly in southern San Mateo and Santa Clara counties, the areas with the most severe air quality problems in the corridor. Based upon projections of potential Caltrain use in 2020, over 8,000 daily auto trips would be removed from corridor roadways as a result of extending Caltrain service to a downtown San Francisco terminal.

## 1.3 PROJECT SPONSORS

Three agencies are cooperating in planning and developing this Transbay Terminal / Caltrain Downtown Extension / Redevelopment project: the City and County of San Francisco, the San Francisco Redevelopment Agency, and the Peninsula Corridor (Caltrain) Joint Powers Board (JPB).

*A joint exercise of powers agreement, signed on April 2, 2001, created the Transbay Joint Power Authority (TJPA),* consisting of the City and County of San Francisco, AC Transit, and the JPB. *Pursuant to the agreement, the TJPA was* formed to "develop, design, construct and operate a new transit terminal and related facilities on and adjacent to the existing Transbay Terminal site." The new TJPA is governed by a five-member board of directors, appointed respectively by the JPB, AC Transit, the San Francisco Mayor, the Muni Board of Directors, and the San Francisco Board of Supervisors (this member is to be a San Francisco Supervisor).

The TJPA is the entity that is obligated to implement and operate the new transit terminal. *Because the project is in the City and County of San Francisco, however, the City's cooperation is necessary. The joint powers agreement creating the TJPA designated the City as the Administrator for the project. When the City approved agreement in Board of Supervisors Resolution 104-01 it supported the project by urging the California legislature to enact legislation to provide land, funding and other measure needed to support the proposed Terminal Plan and Caltrain Extension. The Resolution also* urges BATA to allocate funds from existing seismic surcharge revenues to fund JPA operations and contracts for the Terminal Plan and Caltrain Extension until other funds become available. Finally, it urges the Transbay JPA Directors to approve agreements and leases with AC Transit to ensure that design, construction, and operation of the new Transbay Terminal meet specific performance criteria to maximize the usefulness of the facility for transit operations.

## 1.4 OTHER RELATED PROJECTS

The following paragraphs highlight a few related projects for their coordination or cumulative impact issues and their potential to support or be served by the Caltrain Extension. Section 3.1.5, Future Rail Transit and Bus Services, describes projects planned by individual transit operators. Further detail and an evaluation of land use impacts and development opportunities with the proposed project are presented in Chapters 4 and 5 of this document.

### 1.4.1 BART Extension to San Francisco International Airport

The BART – San Francisco International Airport (SFO) Extension provides 8.7 miles of new revenue service track extending southward from the present Colma Station roughly paralleling El Camino Real and the Caltrain right-of-way, entering and exiting the new San Francisco International Airport Station within SFO on aerial track, and then continuing roughly parallel with El Camino Real and the Caltrain right-of-way to the new Millbrae intermodal station. The BART – SFO Extension includes four new stations: South San Francisco, San Bruno, San Francisco International Airport, and Millbrae. The project provides direct transit access to SFO and constructs the first cross-platform connection between a commuter rail (Caltrain) and rapid rail transit (BART) system west of the Mississippi River.

The BART – SFO Extension is projected to serve 70,000 daily transit trips and to eliminate 10,000 daily auto trips to SFO by 2010. *The extension opened on June 22, 2003.*

### 1.4.2 Millbrae Intermodal Station

The Millbrae intermodal station *serves* both Caltrain and the new BART – SFO Extension. The existing Caltrain Millbrae Station platform *has been* relocated approximately 800 feet north to the new Millbrae Avenue intermodal station, which *incorporates* three BART tracks with one center and one side platform to facilitate train movements. One Caltrain / BART platform *provides* for cross-platform transfers; other transfers *are* accommodated via an aerial walkway. About 3,000 parking spaces *are* provided with a pedestrian bridge to connect between the new parking structure and surface lots and the BART and Caltrain mezzanines.

### 1.4.3 Third Street Light Rail

Muni, the City of San Francisco, and the San Francisco County Transportation Authority have initiated the Third Street Light Rail Project to reestablish rail service along Third Street in the Bayshore Corridor. Construction of the new light rail line is expected to occur in two phases:

- **Phase 1** is currently under design and will extend Muni Metro light rail service south from its current terminal at Fourth and King Streets. The line will cross the Fourth Street Bridge and run along Third Street and Bayshore Boulevard, ending at the Bayshore Caltrain Station in

Visitacion Valley. Tracks will be constructed primarily in the center of the street to improve safety and reliability, and 19 stops will be provided. *This phase of the Third Street LRT Project, the Initial Operating Segment (IOS), is expected to be open for full service in 2005; an early partial opening may occur in late 2004.*

- **Phase 2** would extend light rail service north from King Street along Third Street, entering a new Central Subway near Bryant Street, crossing beneath Market Street and running under Geary and Stockton Streets to Stockton and Clay Streets. Underground subway stations would be located at Moscone Center, Market Street, Union Square and Clay Street in Chinatown. Muni and the City are actively pursuing funding for the Central Subway.

A new Metro East Operating and Maintenance Facility is expected to be built on approximately 13 to17 acres at 25th and Illinois Streets to store, maintain and dispatch light rail vehicles.

### 1.4.4 Mission Bay

Mission Bay is a 300-acre site located south and west of Pacific Bell Park (San Francisco Giants' baseball stadium) and bounded by Townsend, Mariposa, and Seventh Streets, and China Basin that is being developed by Catellus Development Corporation. Over the next decade, it is slated to contain a new 43-acre University of California at San Francisco (UCSF) satellite campus as well as 6,000 apartments, 850,000 square feet of retail shops, up to 6.8 million square feet of commercial space, 49 acres of parks and open space, and a 500-room conference hotel. The UCSF complex and a large residential block are currently under construction.[7]

The JPB has a permanent surface easement on property within the Mission Bay project area that is currently used for railroad purposes.

### 1.4.5 Bay Bridge West Approach, Seismic Retrofit Project

The Bay Bridge West Approach, Seismic Retrofit Project is a Caltrans project that will demolish and reconstruct the West Approach to the Bay Bridge. This section of Interstate 80 runs between the Fifth Street on/off ramps and the First Street on ramp near the western anchorage of the Bay Bridge. The project includes modifications to the on and off ramps in the Transbay Transit Terminal area. New sections of freeway will be built, as well as temporary freeway sections, before demolishing old portions of the freeway. Work is targeted for completion in Winter 2009.

[7] *San Francisco Chronicle*, Monday, October 23, 2000, pages A1 and A15; and Monday, March 19, 2001, p. E1 and E4.

## 1.5 USES OF THIS DOCUMENT

This document is a Final Environmental Impact Statement / Final Environmental Impact Report (Final EIS/EIR), prepared pursuant to the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations implementing NEPA, and the California Environmental Quality Act (CEQA).

This document will be used by federal, state, regional, and local agencies to assess the environmental impacts of the project on resources under their jurisdiction or to make discretionary decisions regarding the project. The Federal Transit Administration, the State of California, and the San Francisco Redevelopment Agency will use this document and the Final EIS/EIR in deciding whether and how to fund the project and in refining the project to minimize its adverse impacts.

## 1.6 PERMITS AND APPROVALS REQUIRED

Anticipated permits and approvals that would be required for this project are shown in Table 1.2-4.

**Table 1.2-4: Permits and Approvals Anticipated to be Required**

| Agency | Approval or Permit |
|---|---|
| State Water Resources Control Board | General Construction Activity Stormwater Permit. |
| California Public Utilities Commission | Permits required for public safety considerations of underground Caltrain Extension and Terminal. |
| *California State Legislature* | *California Public Resources Code Section 5027 requiring approval from the State Legislature prior to demolition of "any building or structure that is listed on the National Register of Historic Places and is transferred from state ownership to another public agency."* |
| San Francisco Bureau of Environmental Health | Permit required for drilling or other subsurface exploration. |
| San Francisco Department of Public Works | Approval required for construction in public rights-of-way. Batch Industrial Wastewater Discharge Permit required for de-watering effluent discharge to the combined sewer system providing the quality of the effluent meets the NPDES General Permit discharge standards. Article 20 of San Francisco Municipal Code requires preparation of a Site Mitigation Plan if soil sampling and analysis indicate presence of hazardous waste in soil subject to construction disturbance. |
| *San Francisco Municipal Transportation Agency* | *Approval required for municipal public transit realignments, surface street changes, traffic operation changes, traffic control measures, and on-street parking changes..* |

**Table 1.2-4: Permits and Approvals Anticipated to be Required**

| Agency | Approval or Permit |
|---|---|
| San Francisco Planning Department/Commission | Certification of CEQA environmental document.<br>Review and approval of Project, including Redevelopment Plan, for consistency with provisions of the Planning Code and with the General Plan. Review and approval of property acquisition, including eminent domain, for consistency with General Plan.<br>Certificate of Appropriateness for modification/demolition of historic resources |
| Peninsula Corridor Joint Powers Board | Certification of CEQA environmental document. |
| San Francisco Board of Supervisors | Approval of General Plan amendments.<br>Adoption of Redevelopment Plan.<br>Approval of property acquisitions, including eminent domain.<br>Approvals required for use of City rights-of-way. |
| San Francisco Redevelopment Commission | Adoption of Redevelopment Plan. |
| San Francisco County Transportation Authority | Review and inclusion of the project in the Countywide Transportation Plan and Capital Improvement Program of the Congestion Management Program for San Francisco. |

# CHAPTER 2: DESCRIPTION OF THE PROJECT ALTERNATIVES

The proposed project has three major components:

- A new, multi-modal Transbay Terminal on the site of the present Transbay Terminal;
- Extension of Caltrain commuter rail service from its current San Francisco terminus at Fourth and Townsend Streets to a new underground terminus underneath the proposed new Transbay Terminal; and
- Establishment of a Redevelopment Area Plan with related development projects, including transit-oriented development in the vicinity of the new multi-modal Transbay Terminal.

Other subordinate components of the project include a temporary bus terminal facility to be used during construction of the new Transbay Terminal; a new, permanent off-site bus storage/layover facility; reconstructed bus ramps leading to the new Transbay Terminal; and a redesigned Caltrain storage yard. Figure 1.2-1 (in Chapter 1) shows the project location.

As described in this chapter, alternatives and options are under consideration for major project components. Section 2.1 describes the No-Project Alternative. Section 2.2 describes proposed project components, alternatives, and build options under consideration. Section 2.3 describes project component alternatives previously considered but subsequently withdrawn from consideration along with the reasons for their withdrawal.

## 2.1 NO-PROJECT ALTERNATIVE

The No-Project Alternative consists of existing Caltrain service with funded improvements, other committed bus, rail, and roadway improvements, a BART extension to the San Francisco International Airport, and proposed development in downtown San Francisco in the 2020 horizon year[1]. This is the No-Project Alternative under CEQA and the baseline alternative for purposes of NEPA.

Under the No-Project Alternative, the San Francisco Redevelopment Agency would not develop or implement a Redevelopment Plan for the Transbay Redevelopment Area. The publicly-owned properties would not be transferred to the Transbay Joint Powers Authority *(TJPA)*, but likely would be developed or sold for development by the state. This development would occur in the absence of a Redevelopment Plan most likely under existing zoning designations and local land use controls.

[1] The horizon year of 2020 was chosen because it is the horizon year for the current (not-updated) MTC regional model as well as for the San Francisco land use projections, on which ridership forecasts are based.

### 2.1.1 CALTRAIN OPERATIONS AND CAPITAL IMPROVEMENTS UNDER THE NO-PROJECT ALTERNATIVE

Caltrain trains consist of diesel-hauled, bi-level "gallery" cars that provide peak period service in both northbound and southbound directions between Gilroy and San Francisco. A total of 80 daily trains operate over the Peninsula Commute Joint Powers Board (JPB)-owned, northern portion of the route between San Jose and San Francisco. Caltrain operates four trains northbound in the morning and four trains southbound in the evening over the southern portion of the Corridor from San Jose to Gilroy, which is owned by the Union Pacific Railroad (UPRR).

JPB has programmed service increases to over *114* daily trains in the San Francisco to San Jose segment and over *20* daily trains in the San Jose to Gilroy segment within the next 10 years, including additional track, signal, station, and terminal capacity improvements to provide for the increased levels of service. JPB anticipates operating *132* daily trains in the 2020 horizon year.

JPB has programmed a series of rehabilitation improvements, enhancements and additions to the existing system that would provide an improved level of service. The following Caltrain facilities will exist at the completion of these projects, consistent with the Caltrain Rapid Rail Study adopted by the JPB in 1998:

- Rehabilitation of the Existing System – long-term repairs, reconstruction and modernization of the existing tracks, signals, bridges, stations, rolling stock and other systems.
- Enhancements and Capacity Improvements – additions and betterments to the rail system, including additional tracks; enhanced signal and communications systems, cab signals, Automatic Train Stop (ATS), and fiber optics; new stations; new shops; buildings and support facilities; vehicular and pedestrian grade separations; and new rolling stock. Also included in this category are grade crossing and station closures and consolidations.
- Increased Caltrain Express service consisting of 20 additional trains per day with an approximate 45-minute travel time between San Francisco and San Jose.
- A variety of passenger station improvements to permit simpler ticketing arrangements and create improved station amenities.

Signal system modernization improvements include a new Centralized Train Control (CTC) system, reverse signaling capabilities, additional train crossovers, and state-of-the-art active warning devices. The CTC would be operated from a new Central Equipment Maintenance and Operations Facility at the Lenzen Maintenance Facility in San Jose, and the existing Operations Center near Diridon Station in San Jose would be phased out.

Track and associated passenger platform improvements at the new Millbrae Intermodal facility are being constructed to improve the interface of the BART extension to San Francisco Airport with Caltrain at the Millbrae Intermodal Station (see Section 1.4.2).

The No-Project Alternative also includes electrification of the entire Caltrain line from Gilroy to its present San Francisco terminus at Fourth and Townsend Streets. The Caltrain Electrification Program would provide for the conversion from diesel-hauled to electric-hauled trains and would require the installation of some 150 to 170 single track miles of overhead contact system (OCS) for the distribution of electrical power to the electric rolling stock. Electric rolling stock would consist of locomotives or electrical multiple unit (EMU) cars. The OCS would be powered from a 25 kV, 60 Hz, single-phase, alternating current (ac) supply system that would require the installation of two or three traction power substations, one or two switching stations, and nine or ten paralleling stations. This power supply and distribution system and voltage are compatible with the requirements of high-speed rail, and therefore will accommodate future development of high-speed rail in the Caltrain corridor without major overhaul of the new electrification facilities. The Caltrain Electrification Program is being evaluated by the JPB in a separate environmental document.

Electrification of the Caltrain line is scheduled to be implemented by 2006. It is currently programmed under Track 1 of the 2001 Regional Transportation Plan (RTP), and will be funded entirely from local sources. The environmental review process for this program is expected to be completed *during 2004*, and it is assumed that the Electrification Program would be in place prior to implementation of the Caltrain Downtown Extension component of the present project.

Should electrification not be implemented in advance of the Downtown Extension, however, the extension could still be implemented using dual-mode (diesel-electric) locomotives. Dual-mode locomotives would enable Caltrain service to switch from diesel powered to electric powered propulsion before entering downtown San Francisco. A more detailed discussion of this propulsion option is provided in the 1997 Draft EIS/EIR for the Caltrain Downtown Extension. Should this option be necessary, the purchase of dual-mode locomotives would need to be added to the project costs for the Downtown Extension component. These potential costs are estimated to be $235 million in 2002 dollars for 34 locomotives.

### 2.1.2 MUNI FACILITIES AND RELATED BUS SERVICE UNDER THE NO-PROJECT ALTERNATIVE

The No-Project Alternative includes all current San Francisco Municipal Railway (Muni) service at existing levels plus the following major planned, ongoing, or constructed projects:

- S-Castro-Embarcadero Shuttle – new eastbound and westbound service between the Castro and Embarcadero stations;
- Third Street Light Rail project – extension of Muni Metro light rail service south from its current terminus at Fourth and Townsend Streets. The Third Street Light Rail line will cross the Fourth Street Bridge and run along Third Street and Bayshore Boulevard, ending at the Bayshore Caltrain Station in Visitacion Valley; and
- Central Subway – extension of Third Street light rail service northward from King Street along Third Street, entering a new central subway near Bryant Street, crossing beneath Market Street and running under Geary and Stockton Street to Stockton and Clay Streets.

*The Third Street LRT Project Initial Operating Segment (IOS) is expected to be open for full service in 2005; an early partial opening may occur in late 2004.* The Central Subway project is scheduled to be constructed by *2012* but is not presently funded. Muni and the San Francisco County Transportation Authority are actively pursuing funding, and the project is included in the No-Project Alternative in anticipation of funding being included in the 2001 Regional Transportation Plan in time for the Central Subway to be completed within the horizon year for the present project. Other planned, ongoing, or completed service changes and improvements included in the No-Project Alternative are summarized in Table 2.1-1.

### 2.1.3 Bay Area Rapid Transit System (BART)

*On June 22, 2003, the* San Francisco Bay Area Rapid Transit District (BART) *opened* an extension to San Francisco International Airport that also *interfaces* with Caltrain and SamTrans bus services at the new Millbrae Intermodal Station. *Extensions from Hayward to Warm Springs and from Warm Springs to Santa Clara are also planned.*

### 2.1.4 San Mateo County Transit System (SamTrans)

In August 1999, SamTrans introduced a variety of changes to improve the efficiency of its core system. The changes reallocated service from areas of little demand to areas of greater demand. In many instances, routes were consolidated to increase service efficiency and permit increased frequency.

### 2.1.5 Roadway and Street Improvements

The No-Project Alternative assumes the completion of Caltrans San Francisco Seismic Retrofit projects, as follows:

- Yerba Buena Island Viaduct and tunnel
- West Span of the Bay Bridge (from Yerba Buena Island to the San Francisco Anchorage)
- Elevated West Approach to the Bay Bridge (from the Anchorage to the Fifth Street ramp)
- Elevated Bayshore Viaduct (I-80 from Fourth Street to Sixteenth Street)

**Table 2.1-1: Other Muni Service Changes and Improvements Included in the No-Project Alternative**

| Service Change | Description | Status | Source |
|---|---|---|---|
| Caltrain Express Bus Service Consolidation (80x / 81x / 82x) | Consolidation of 80x and 82x lines concurrent with the extension of N-Judah to Caltrain Terminal at Fourth and Townsend; consideration to elimination of 81x | Implemented June 1999 | Muni SRTP 2000 |
| Ferry Bus Terminal *Relocation* | Relocation of the Ferry Terminal off-street bus turn-around to new curb-side terminals on the surrounding streets, to allow development of the current bus turn-around area as a hotel, to produce revenue for Muni projects | *Implemented Fall 2001* | Muni SRTP 2000 |
| *F-Line* | *Muni's F-Line Historic streetcar service opened for service from Castro/Market Streets along the Embarcadero to Fisherman's Wharf in 2000, and currently carries approximately 20,000 riders per day.* | *March 2000* | *Muni comments on DEIS 2002* |
| *E-Line* | *Muni's E-Line station improvements on The Embarcadero and King Streets for historic streetcar service between Fisherman's Wharf and 4th/King Streets will be under construction in 2003.* | *Under construction in 2003* | *Muni comments on DEIS 2002* |
| 15 – Third Street line | 15-Third line to be completely discontinued with implementation of the Third Street Light Rail project in *full operation in 2005* | *2005* | Muni SRTP 2000 |
| 6-Parnassus Downtown Terminal | Downtown terminal for the 6 Parnassus line changed from Ferry Terminal to Transbay Terminal | Implemented March 2000 | Muni SRTP 2000 |
| 12-Folsom | Extended service hours, days, and frequencies; outbound route moved from Howard Street to Harrison Street (between Embarcadero and 11th Streets); service extended to Embarcadero, connecting with F-Market line at the Ferry Building; 83-Pacific route abandoned, replaced by increased service on 12-Folsom | Implemented February 2001 | Revised SOMA Action Plan, 12/5/00 |
| N-Owl Service | Extend N-Owl buses from current inner terminal at Ferry Terminal to the Caltrain Fourth and Townsend terminal, via Embarcadero and King Streets | Implemented February 2001 | Revised SOMA Action Plan, 12/5/00 |
| 47-Van Ness Motor Coach | 47-Van Ness motor coach (originally called line "42W") – New Van Ness corridor line with terminals in eastern Fisherman's Wharf and at the Caltrain Fourth and Townsend terminal. | Implemented Spring 2001 | Revised SOMA Action Plan, 12/5/00 |
| 10-Townsend | 10-Townsend (originally called line 42E) – new line connecting Fisherman's Wharf, the Financial District, Caltrain, SOMA, and Potrero Hill with terminals at Van Ness and North Point. Initial service will be between the northern terminal in Fisherman's Wharf and a temporary southern terminal at Seventh and De Haro. | Implemented Spring 2001 | Revised SOMA Action Plan, 12/5/00 |

**Table 2.1-1: Other Muni Service Changes and Improvements Included in the No-Project Alternative**

| | | | |
|---|---|---|---|
| 9-San Bruno | Additional 9-San Bruno trolley coach service (two additional coaches) between the vicinity of San Francisco General Hospital and the Ferry Terminal on weekdays | Implemented Spring 2001 | Revised SOMA Action Plan, 12/5/00 |
| Central Subway | Extension of Third Street light rail service from King Street along Third Street, entering a new central subway near Bryant Street, crossing beneath Market Street and running under Geary and Stockton Streets to Stockton and Clay Street. | To open in *2012* | Muni SRTP 2000 |

Notes: SRTP = Short Range Transit Plan; SOMA = South of Market Area

- Elevated Central Freeway (US 101 – connects I-80 with *Market Street, with the proposed Octavia Boulevard providing the connection to Oak and Fell streets*)

These projects have all entered or completed construction. Retrofit construction on the Yerba Buena viaduct and tunnel was completed in 2000. Retrofit of the west Bay Bridge span piers is complete. Retrofit of the west span towers and bridge structure is scheduled to be completed by Spring 2003, and the west approach by Spring 2007. The Central Freeway retrofit is scheduled for completion by September 2005.

Other roadway and street improvements planned and programmed by the City and County of San Francisco's Department of Parking and Traffic or the Department of Public Works include two projects in the vicinity of the Transbay Terminal/Downtown Caltrain Extension project: striping a transit-only lane along Third Street, and providing a new King Street access roadway at Fifth Street into Mission Bay *(from south of King Street across Mission Creek)*.

## 2.2 PROJECT COMPONENTS

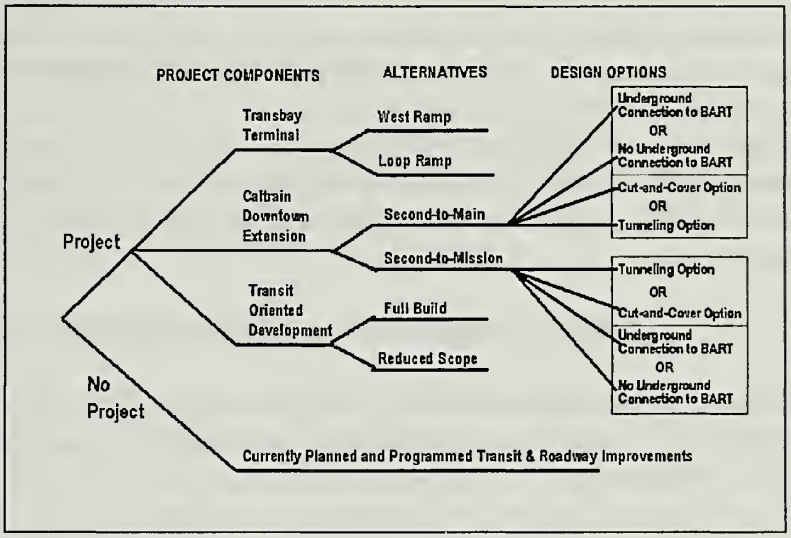
The proposed project includes three major components, each with two alternatives, as follow:

(1) A new Transbay Terminal to serve as a multi-modal transit/transportation facility that incorporates the principles of sustainability and environmental responsibility at the site of the current Transbay Terminal at First and Mission Streets in downtown San Francisco.

(2) An underground extension of Caltrain commuter rail service from its current San Francisco terminus at Fourth and Townsend Streets to a new underground terminus in the basement of the proposed new Transbay Terminal.

(3) Adoption of a Redevelopment Plan for the Transbay Project Area and related development projects, including transit-oriented development. The plan and related development would permit tax increment financing to assist in financing of the transportation improvements and other redevelopment projects.

Two alternatives are under consideration for each major project components. Other components of the project include a temporary bus terminal facility to be used during construction, a new, permanent off-site bus storage/ layover facility, reconstructed bus ramps leading to the west end of the new Transbay Terminal, and a redesigned Caltrain storage yard. A schematic diagram of the project components, alternatives, and design options is shown on the right.




### *2.2.1 REFINEMENTS TO THE PROJECT AND EIS/EIR*

*Refinements have been made to the Project and EIS/EIR since the Draft EIS/EIR was published. Under both the federal and state environmental processes, refinements are often made to the EIS/EIR in response to both public comments and any additional project planning that have occurred. The Federal Department of Transportation, Federal Transit Administration (DOT/FTA) procedures and regulations also call for selection of a Locally Preferred Alternative (LPA) from among the various project alternatives evaluated in the Draft EIS/EIR. Detailed analysis and mitigation measures are provided for the LPA and the other alternatives in this Final EIS/EIR. Per CEQA Section 15088.5, none of the refinements identified below and evaluated in this Final EIS/EIR introduce significant new information or new adverse impacts that cannot be mitigated.*

#### *2.2.1.1 Adoption of a Locally Preferred Alternative*

*Following the DOT/FTA guidance and regulations, the TJPA adopted in March 2003 the West Ramp Transbay Terminal, Second-to-Main, Tunneling, Full Build Options as the components to be included in the Locally Preferred Alternative (LPA) for inclusion in the Final EIS/EIR. A Locally Preferred Alternative Report for the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project (March 2003[2]) was prepared in advance of the LPA selection and is incorporated herein by reference.*

[2] This LPA report is available for public review by appointment in case file 2000.048E at the Planning Department at 1660 Mission Street, San Francisco.

#### *2.2.1.2 Movement of the Transbay Terminal Footprint to the West*

*In response to public comment on the Draft EIS/EIR, the co-lead agencies – the City and County of San Francisco, the JPB, the San Francisco Redevelopment Agency and FTA – propose to relocate the footprint of the new Transbay Terminal to the west (approximately 150 feet) of the location shown in the Draft EIS/EIR. This would result in the terminal structure no longer spanning Beale Street, thus reducing capital costs without substantially changing environmental effects or the operations and efficiency of the terminal. This change is described in Section 2.2.2.*

#### *2.2.1.3 Elimination of the Temporary Bus Ramps to the Temporary Terminal*

*In response to public comment regarding the need to reduce overall project costs, AC Transit bus access to the temporary terminal will no longer make use of a temporary bus ramp between the Bay Bridge and the temporary terminal during operation of the temporary facility. The proposed access to/from the temporary terminal for AC Transit buses is described in Section 2.2.2, and the impacts and mitigation measures associated with this access are detailed in Section 5.21.1.1 of the Final EIS/EIR.*

#### *2.2.1.4 Supplemental Air Emissions Assessment of the Permanent Off-Site Bus Storage Facility*

*In response to public comments on the Draft EIS/EIR, the co-lead agencies completed a supplemental air emissions assessment of the proposed permanent off-site bus storage facility under the West Approach to the Bay Bridge between Second and Fourth Streets. Findings of this supplemental analysis are provided in Section 5.7.3 and were used to respond to questions and comments raised during the public review period (please see Volume II of this Final EIS/EIR).*

#### *2.2.1.5 Supplemental Noise Assessment for the Permanent Off-Site Bus Storage Facility*

*In response to public comments on the Draft EIS/EIR, the co-lead agencies completed a supplemental noise assessment of the proposed permanent off-site bus storage facility under the West Approach of the Bay Bridge between Second and Fourth Streets. Findings of this supplemental analysis are provided in Section 5.8.6 and were used to respond to questions and comments raised during the public review period (please see Volume II of this Final EIS/EIR).*

#### *2.2.1.6 Refinements to the 2nd-to-Main and 2nd-to-Mission Caltrain Extension Alternative Alignments and Station Layout*

*In response to public comments on both alternatives for the Caltrain Extension, the JPB, working with the TJPA, the City and County of San Francisco and the Redevelopment Agency, developed engineering refinements to the Second-to-Mission and Second-to-Main options for the*

*Caltrain Downtown Extension that appeared in the Draft EIS/EIR. Refinements include changes to the track, platform, and tail track layouts. Section 2.2.3 describes these revisions. Meetings were held to discuss these refinements with the public.*

#### *2.2.1.7 Revised Caltrain Operating Plan Assumptions*

*The number of daily Caltrain trains assumed to be operated in the Year 2020 has been revised downward from 170 to 132, as shown in Section 3.1.6.2 in this Final EIS/EIR, reflecting more recent planning of the JPB. Train ridership projections have been revised to reflect this new assumed Caltrain service level, as described in Section 3.1.6.2 and 5.19.2.*

#### *2.2.1.8 Revised Project Construction/Implementation Schedule*

*In response to public comments, the co-lead agencies have refined and updated the proposed project construction and implementation schedule, which is shown in Figure 5.20-8, Section 5.20.*

#### *2.2.1.9 Revised Project Capital Costs*

*In response to public comments on the Draft EIS/EIR, the co-lead agencies have refined the capital cost estimates for both the new Transbay Terminal and the Caltrain Downtown Extension. The refined costs are provided for the Locally Preferred Alternative and the refinement results in an overall cost reduction of $143.7 million in 2003 dollars for the Project. The refined costs have been assigned to an anticipated year of expenditure assuming the refined construction/implementation schedule (shown in Figure 5.20-8), and inflation rates have been applied to provide a year-of-expenditure cost estimate for the LPA, thus providing a more accurate estimate of the Project's overall costs. These revised costs are provided in Chapter 6 and in Section 2.2.2.4 for the Transbay Terminal and Section 2.2.3.5 for the Caltrain Downtown Extension. If an alternative other than the LPA were to be chosen, capital costs for the Project would increase.*

#### *2.2.1.10 Revised Project Financial Plan*

*The Project's financial plan has been refined to reflect the revised capital costs, the anticipated year of expenditure for various costs, and recent events regarding various funding sources. The refined financial plan is provided in Chapter 6 of this Final EIS/EIR.*

#### *2.2.1.11 Release of Draft Transbay Redevelopment Project Area Design for Development Vision/Redevelopment Boundary Revision*

*In response to public comments on the Draft EIS/EIR and to advance the planning work for the proposed Transbay Redevelopment Area, the San Francisco Redevelopment Agency has released for public review the Draft Transbay Redevelopment Project Area Design for Development*

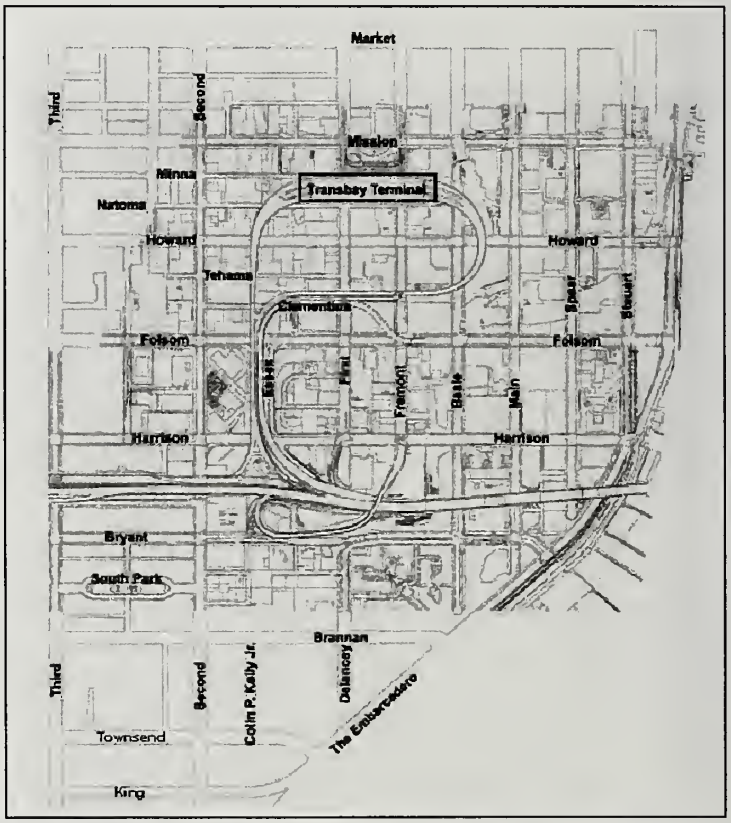
*Vision (August 2003). Development of the Draft Transbay Redevelopment Project Area Design for Development Vision involved extensive public input and involvement. The Draft Vision provides additional detail regarding the possible elements of the final Redevelopment Area Plan, as described in Section 2.2.4. This section also describes revisions to the proposed redevelopment area boundary made in response to public comments.*

#### *2.2.1.12 Revisions in Response to Public Comments on the Draft EIS/EIR*

*Other revisions/refinements have been made in this Final EIS/EIR in response to public comments received on the Draft EIS/EIR. Volume II of this Final EIS/EIR contains the comments given on the Draft EIS/EIR and the responses to these comments. As indicated in Volume II, responses at times led to revisions to the Final EIS/EIR. All refinements and revisions to the Draft EIS/EIR are outlined in this Final EIS/EIR in italics.*

### *2.2.2* TRANSBAY TERMINAL ALTERNATIVES

Two alternatives *were* studied for a new Transbay Terminal. Under either alternative, a new multi-modal terminal would be located at the same site as the existing terminal at Mission and First Streets (see figure to the right).




Bus ramps would connect directly from the terminal to the Bay Bridge, while an underground rail facility would allow the extension of Caltrain to downtown and provide space for potential future East Bay commuter rail and California's high-speed intercity rail.

With either Transbay Terminal Alternative, facilities would be included for AC Transit, Greyhound, Greyhound Package Express, Muni buses and trolley coaches, Golden Gate Transit *(GGT)* basic service buses, taxi service, and easily accessible bicycle storage. SamTrans buses would operate on local streets adjacent to the new terminal. Each alternative would include space for retail and cultural uses. Under current plans, full or partial acquisition of five parcels of land and demolition of five buildings would be

required for either Transbay Terminal Alternative and for the Temporary Terminal described in Section 2.2.1.3.

One concept for the terminal would incorporate sustainable design features that would allow the building to use site-specific wind, daylight and shading to reduce the building's energy needs. The design of the roof and exterior walls would facilitate natural ventilation and natural lighting of the interior. Mechanical cooling would be used only for enclosed office areas and data equipment rooms. Photovoltaic panels are proposed on the roof structure to capture solar energy. Rainwater would be captured for maintenance and irrigation of landscaping.

### *2.2.2.1* Transbay Terminal West Ramp Alternative

Figure 2.2-1 shows the Transbay Terminal West Ramp Alternative, including the locations of bus ramps leading to the terminal and off-site bus storage. *This figure reflects the revised location of the terminal (moved to the West) and the relocated permanent bus access ramps. The Transbay Terminal West Ramp Alternative was selected in March 2003 by the TJPA as the Transbay Terminal Component of the LPA.*

As developed during the Metropolitan Transportation Commission (MTC) study,[3] conceptual plans for this alternative include a terminal one block (165 feet) wide by three blocks (1,300 feet) long. It would include six levels, with four levels above ground and two below. The currently proposed terminal floor plan is described below.

**Train Level:** Train platforms would be two levels below grade. The actual location of platforms would vary for the two Caltrain Downtown Extension alternatives. Under either of the Caltrain Downtown Extension alternatives, there would be a direct connection to the train platforms from the Transbay Terminal.

**Train Mezzanine Level:** A train mezzanine would be one level below the street level – one level above the train platforms. It would accommodate train passenger ticketing services and passenger queuing. Building mechanical systems would also be located on this level. *This level would have sufficient space and would be designed so as not to preclude Muni Metro tracks leading from the proposed Third Street and Geary Corridor alignments.*

**Street Level:** As shown in Figure 2.2-2, the portion of the terminal on street level between Beale and Fremont Streets would accommodate Muni buses and trolley coaches, as well as Golden Gate Transit basic service buses. *A traffic signal would be provided for Muni and GGT as they exit this facility onto Fremont Street.* The west side would include some retail. A lobby for Greyhound/Greyhound Package Express is assumed on the east side of Beale Street.

**Concourse Level:** The second floor would function as a pedestrian concourse, connecting the various blocks one full story (20 feet) above street level. This area is currently assumed to include 150,000 to 225,000 square feet of retail, entertainment, conference, and educational and cultural space.

[3] Transbay Terminal Improvement Plan Study, Metropolitan Transportation Commission, 2001.

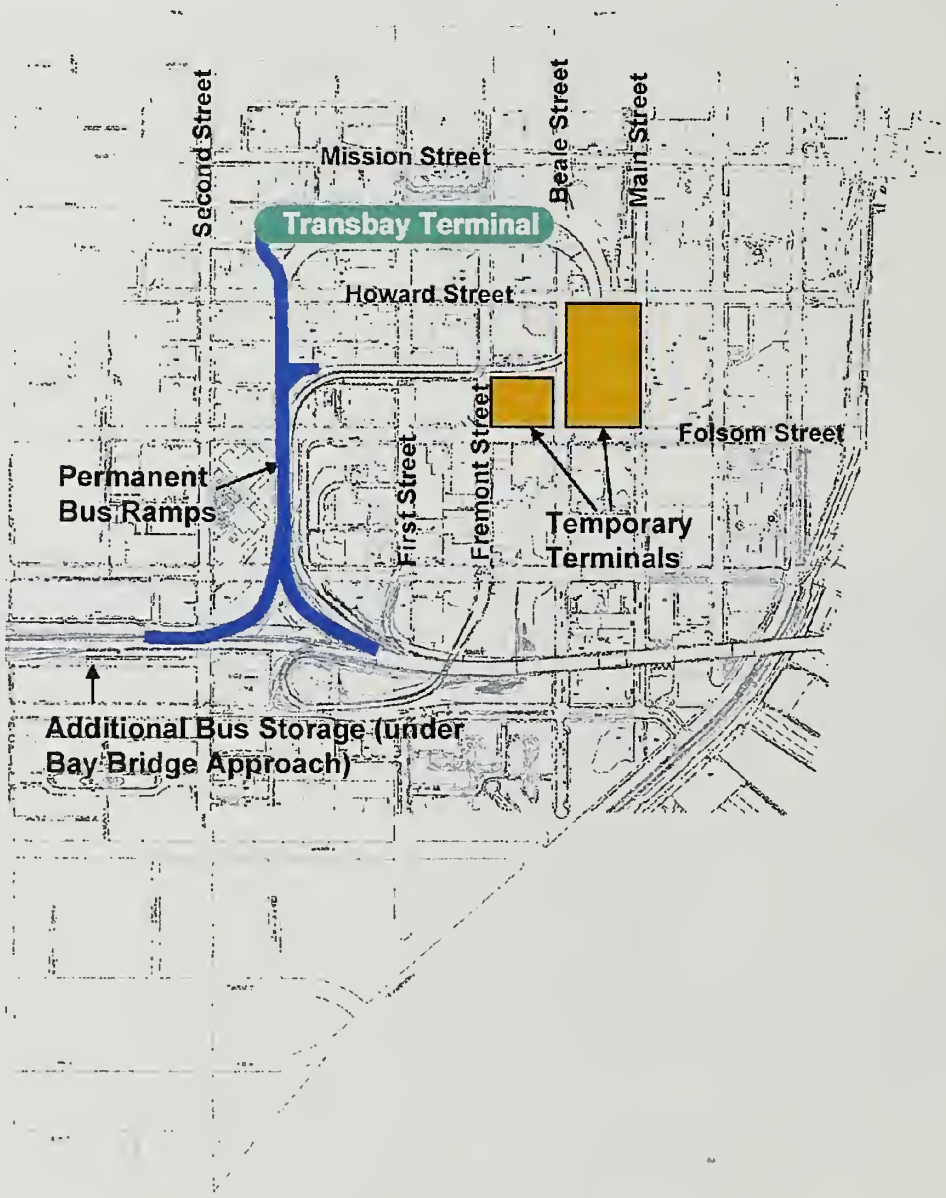
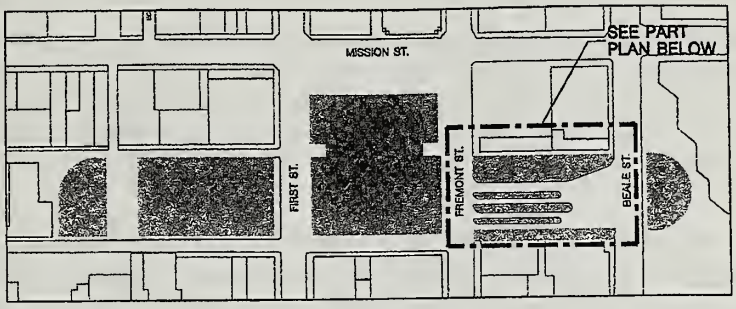



**Figure 2.2-1:Transbay Terminal West Ramp Alternative**
**Location of Terminal Components**




PLAN AT ENTRY LEVEL

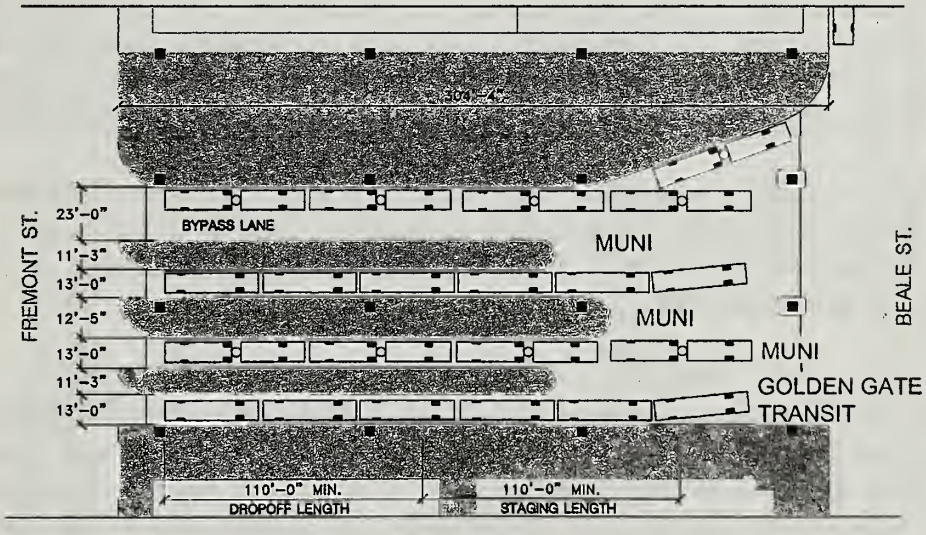



**Figure 2.2-2: Transbay Terminal- - Muni and Golden Gate Transit Street-Level Facilities**

**AC Transit Level:** The third floor (Lower Bus Level) would be 40 feet above street level, and would accommodate the transbay AC Transit commuter operation. It would permit 26 articulated and four standard buses simultaneously to serve arriving and departing passengers. As shown in Figure 2.2-3, Bus Deck 1 would be served by ramps that connect directly to the Bay Bridge. An interior full loop would be provided for bus circulation with two lanes – one through lane and one turnout lane.

**Upper Bus Level:** The fourth floor (Upper Bus Level) would be 60 feet above street level, and would consist of a partial level on the north side of the building, shown in Figure 2.2-3. It would provide half-loop service with two bus lanes – one through lane and one turnout/parking lane – to bus lines other than AC Transit. This would include Muni service to Treasure Island, paratransit, Greyhound, and private operators. Six bus bays would be included, plus 700 feet of straight curb.

Vertical circulation – escalators and elevators – would be provided between all of the levels for pedestrian/passenger flows. Conceptual plans for this terminal alternative include approximately 200,000 square feet of transit-oriented and retail development and 900,000 square feet of transit support and loading areas and mechanical support, yielding a total floor area just over one million square feet.[4]

**Bus Ramps and Circulation**. As shown in Figure 2.2-1, the direct bus ramps would be on the west side of the building, offering dedicated connections between the Bay Bridge and Transbay Terminal Bus levels 1 and 2. These ramps would be in *generally* the same position as the existing ramps on the west side of the terminal and paralleling Essex Street. *Figure 2.2-4 shows the location of the refined West Ramp leading to the terminal that has been moved to the west.*

Construction of these ramps would require the acquisition and demolition of one building east of the ramps and south of Howard Street and the removal of a portion of the back of the building east of the ramps and north of Howard Street. Existing bus ramps would need to be demolished and reconstructed to accommodate the new Terminal.

The ramp leading to and coming from the lower bus level would be a two-way ramp, with a single 12-foot lane in each direction. A minimum 20-foot width would be provided to allow vehicles to pass and continue bus service in the event of a vehicle breakdown. The ramp would divide into two at the entrance to the terminal, with an upper level ramp and a lower level ramp. Figure 2.2-5 shows a visual simulation of the stacked ramp configuration across Howard Street.

The upper level connection would have one lane functioning as an entrance to the upper bus level. The lower level bus ramp would have two lanes, functioning as both an entrance and an exit for lower bus level. Bus turnaround loops would be provided on each bus level at the east end of the terminal (see Figure 2.2-3).

[4] Possible use of a new Terminal for a transit operator emergency control center has been proposed by the San Francisco Redevelopment Agency and may be evaluated in the future by the *TJPA*.

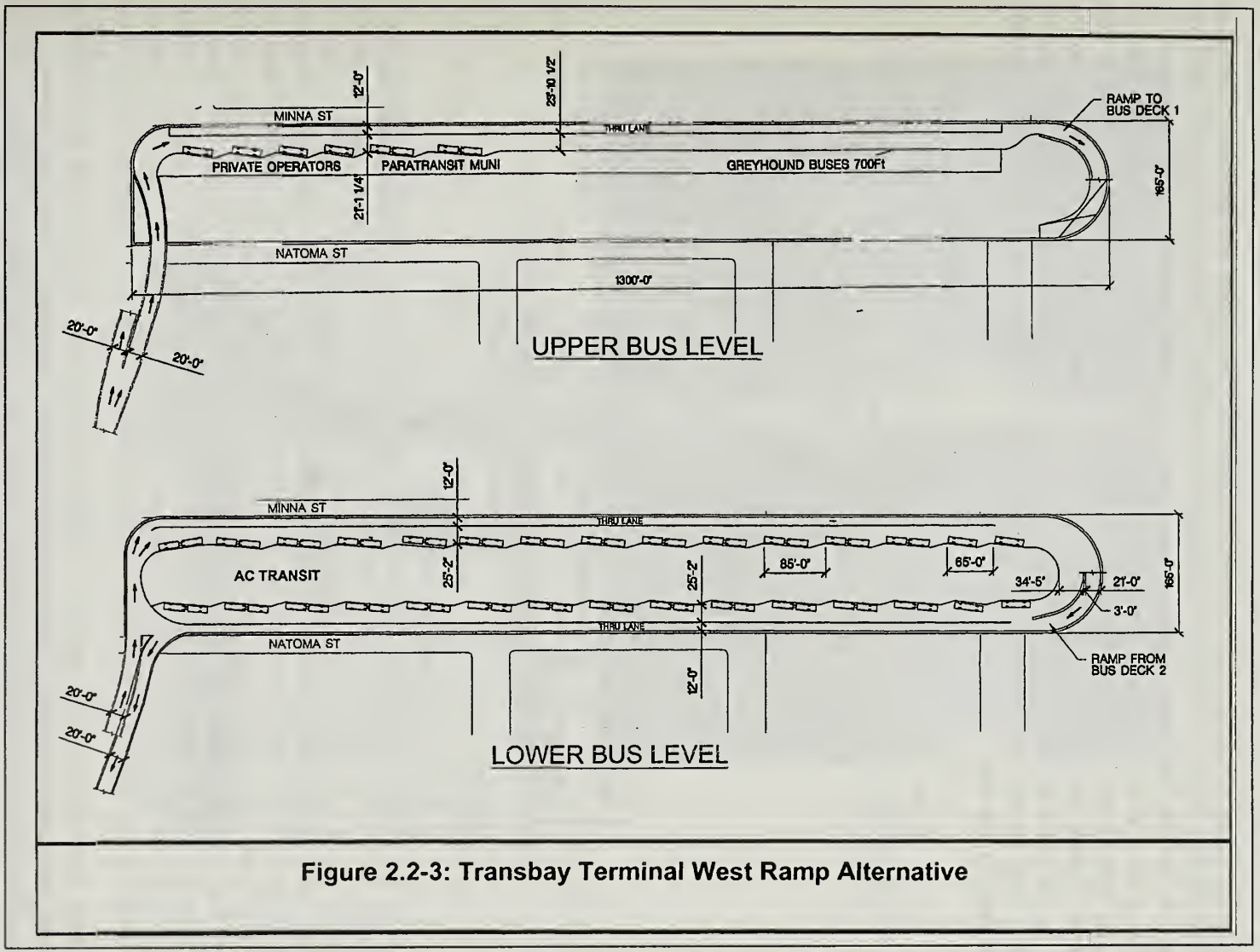
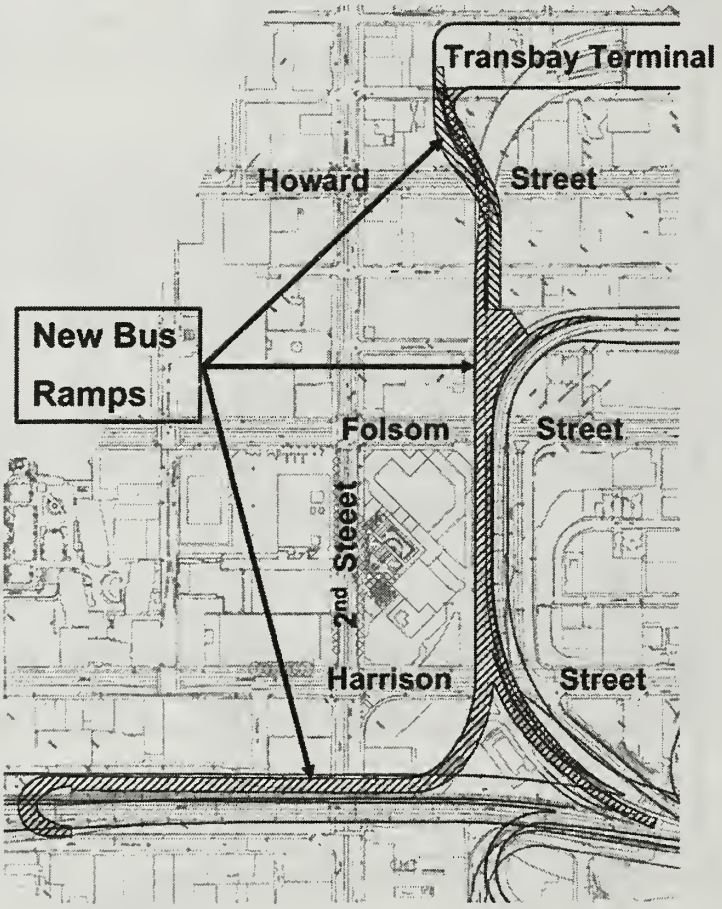



**Figure 2.2-3: Transbay Terminal West Ramp Alternative**

Buses would travel from the upper bus level down an exit ramp inside the terminal to the lower (AC Transit) bus level, and all buses would depart the terminal on the lower bus ramp to the Bay Bridge. At the Bay Bridge approach connection, the ramps would again be divided and stacked. The lower level would provide access to the bridge for eastbound buses leaving the terminal, while the upper level would serve westbound buses coming from the bridge and destined for the terminal. Current conceptual designs would allow for the staging of at least four buses on the ramp at the entrance to the terminal approaching the lower bus level. This configuration, together with the bus ramp storage link (described below) would include a total of 235,000 square feet of ramp area.

**Figure 2.2-4: Transbay Terminal Off-Site Bus Storage Link Ramp**




SamTrans bus service would operate on Mission Street using all bus stops for passenger alighting, and would terminate on either Mission Street between Fremont and Beale or on Howard Street between Beale and Fremont. After layover, SamTrans buses would load on Fremont, immediately south of the terminal (about 100 feet north of the Howard/Fremont intersection) and would then make stops on Mission Street for passenger boarding.

Fig 2A Existing Conditions

Fig 2B West Ramp Alternative

View from Howard Street
Near First Street
Looking Northwest

SOURCE Parsons

**Figure 2.2-5: Visual Simulation of Staked Ramps at Howard Street West Ramp Alternative**

**AC Transit Bus Storage.** As shown on Figure 2.2-1 and detailed in Figure 2.2-*6*, bus storage would be off-site, under the west Bay Bridge approaches between Second and Fourth Streets. AC Transit storage would be at-grade between Second and Third Streets. Two optional conceptual designs have been developed for bus storage at this site. The storage area would accommodate either 42 or 53 buses, depending upon the selected layout for storing of the vehicles. Access to this bus storage area would be via *Fourth* Street and a two-way "storage link" ramp that would connect with the Transbay Terminal bus ramps. The plans include a building to house a lounge and restrooms for the drivers and office space for supervisory personnel. *A 10- to 12-foot noise wall would be provided along the southern boundary of the AC Transit off-site bus facility. Noise wall would also be provided along the bus ramps adjoining this facility.*

**Golden Gate Transit Bus Storage.** Golden Gate Transit weekday bus storage would be under the west approaches to the Bay Bridge, between *Third* and *Fourth* Streets. Based on current conceptual designs, approximately 140 buses could be accommodated on a paved at-grade lot.

The lot could be available for other uses in the evening and on weekends when Golden Gate Transit stores its buses elsewhere. *A 10- to 12-foot noise wall is proposed along the southern boundary of the Golden Gate Transit off-site bus facility and a portion of the eastern boundary of this facility.*

To minimize the impacts on neighborhood parking near the bus storage lot, a single level parking structure is proposed in the location shown on Figure 2.2-*6*. This structure, as currently conceived, would provide parking for up to 300 vehicles on two levels.

#### *2.2.2.2* Transbay Terminal Loop Ramp Alternative

Figure 2.2-7 shows the Transbay Terminal Loop Ramp Alternative. This alternative would involve the demolition and reconstruction of both the existing western and eastern bus ramps between the Transbay Terminal and the Bay Bridge. The new Transbay Terminal would be one block wide and three and three-fourths blocks in length. It would include five levels, with two levels above ground and two below. The currently proposed terminal floor plan is described below.

**Train Level:** Train platforms would be two levels below grade. The actual location of platforms would vary for the two Caltrain Downtown Extension alternatives. Under any of the Caltrain Downtown Extension alternatives, there would be a direct connection to the train platforms from the Transbay Terminal.

**Train Mezzanine Level:** A train mezzanine would be one level below the street level – one level above the train platforms. It would accommodate train passenger ticketing services and passenger queuing. Building mechanical systems would also be located on this level. *This level would have sufficient space and would be designed so as not to preclude Muni Metro tracks leading from the proposed Third Street and Geary Corridor alignments.*

**Street Level:** As shown in Figure 2.2-2, the portion of the terminal on street level between Beale and Fremont Streets would accommodate Muni buses and trolley coaches, as well as Golden Gate Transit basic service buses. *A traffic signal would be provided for Muni and GGT as they exit this facility onto Fremont Street.* The west side would include some retail. A lobby for Greyhound/Greyhound Package Express is assumed on the east side of Beale Street.

**Concourse Level:** The second floor would function as a pedestrian concourse, connecting the various blocks one full story (20 feet) above street level. This area would include 150,000 to 225,000 square feet of retail, entertainment, conference, and educational and cultural space.

**Bus Level** The third floor would be 40 feet above street level, and would accommodate AC Transit and all other bus operators. There would be 51 bus bays, served by three one-way bus lanes. The elevated transit loop would be in the same general location as the existing Transbay Terminal bus ramps and would connect directly to the Bay Bridge. Buses would enter the terminal from the east and exit to the west.

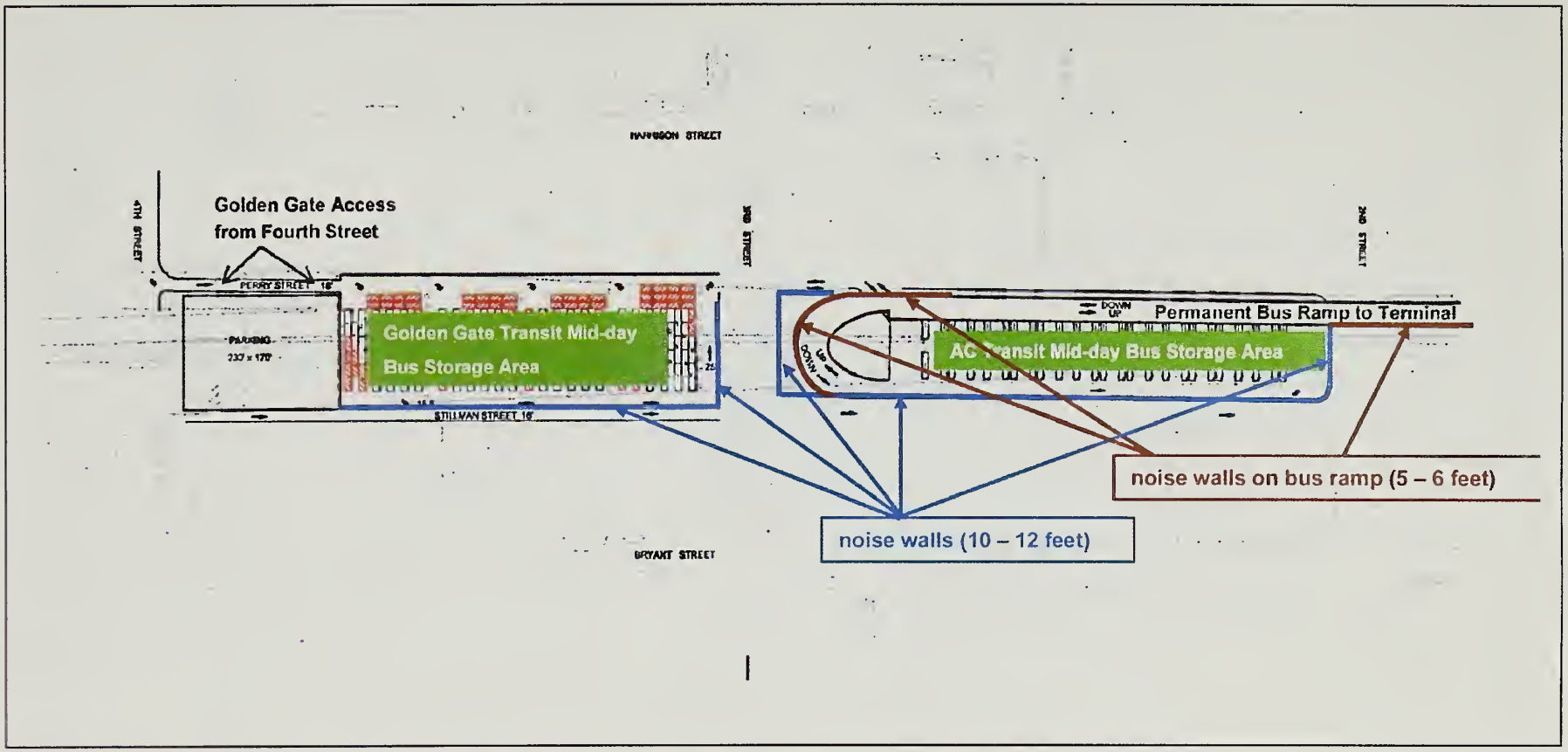



**Figure 2.2-6: Transbay Terminal Off-Site Bus Storage**

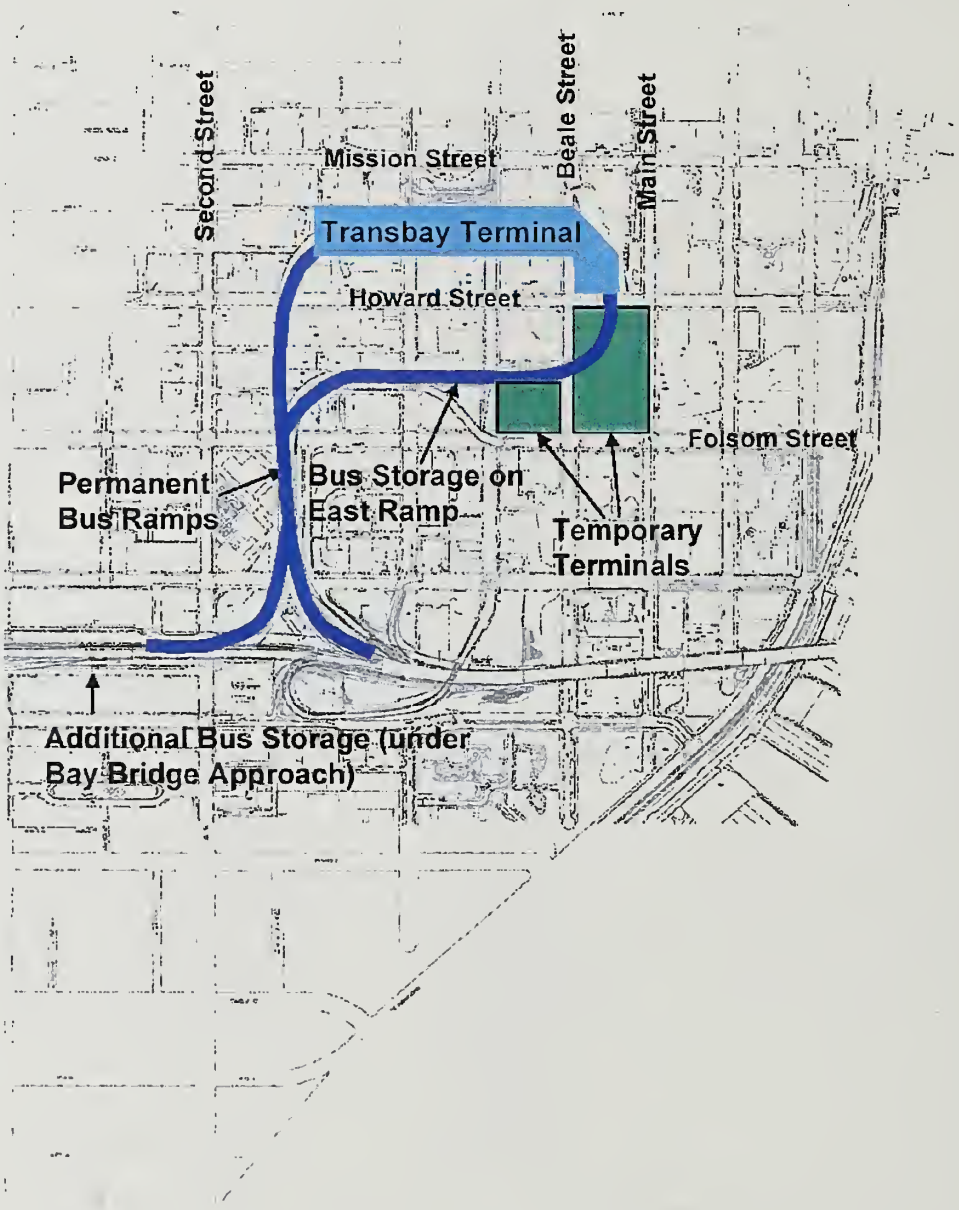



**Figure 2.2-7:Transbay Terminal Loop Ramp Alternative Location of Terminal Components**

Vertical circulation – escalators and elevators – would be provided between all of the levels for pedestrian/passenger flows. Bus operations for the Transbay Terminal Loop Ramp Alternative would be very similar to the current facility, with AC Transit and other bus operators operating on the second floor, and with buses entering from the east and exiting to the west. Muni and Golden Gate Transit operations would be moved to between Beale and Fremont Streets at street level, as described for the Transbay Terminal West Ramp Alternative.

Preliminary plans for this terminal alternative include approximately 175,000 square feet of transit-oriented and retail development and 750,000 square feet of transit support and loading areas and mechanical support, yielding a total floor area just under one million square feet.[5]

**Bus Ramps and Circulation.** The Transbay Terminal Loop Ramp Alternative would involve the demolition and construction of new bus ramp structures, providing for a full one-way loop of bus circulation through the Transbay Terminal with direct connections to the Bay Bridge on both the east and west sides of the terminal (See Figure 2.2-7). A total of 380,000 square feet of ramp area would be provided. Construction of these ramps would require the acquisition and demolition of one building east of the ramps and south of Howard Street and the removal of a portion of the back of the building east of the ramps and north of Howard Street. SamTrans bus operations would be as described for the West Ramp Alternative.

**Bus Storage.** The Loop Ramp Alternative would allow for approximately 120 standard 40-foot buses to be stored on the eastern bus ramps, with the remaining bus storage off-site at one or both bus storage sites described under the West Ramp Alternative.

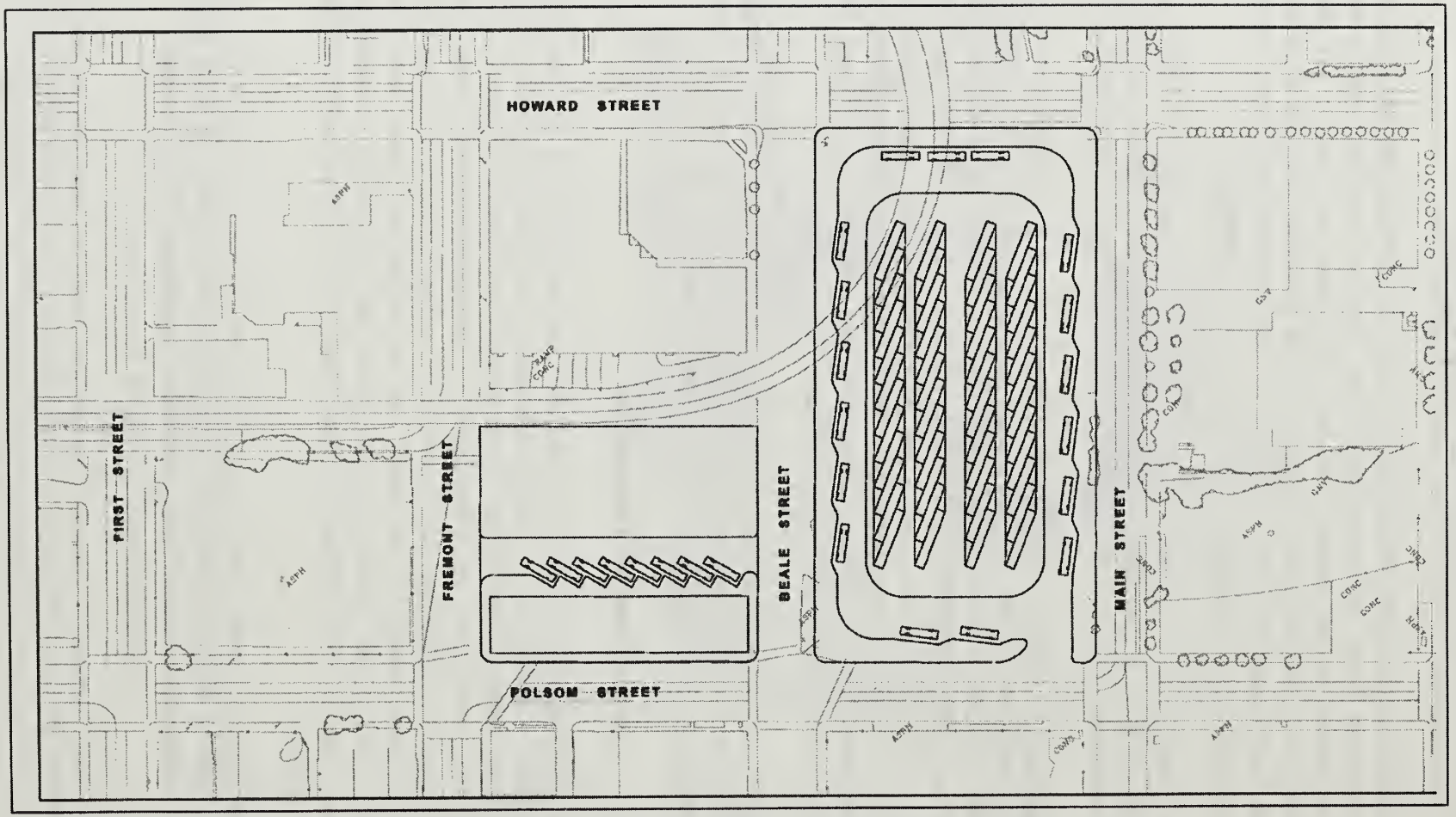
### *2.2.2.3* Transbay Terminal Construction

**Temporary Bus Facilities**. During construction of the new Transbay Terminal, two temporary surface terminals would be built. A temporary terminal for Greyhound buses would be located on Folsom Street between Fremont and Beale Streets. As shown in Figure 2.2-8, a temporary terminal for AC Transit buses would be located on the block bounded by Beale, Howard, Main, and Folsom Streets. A minimum of 16 saw-tooth bus spaces for AC Transit and eight bus spaces for Greyhound buses would be provided, based on preliminary plans. Amenities would be minimal and would include ticketing for AC Transit and Greyhound, restrooms, and sheltered waiting areas. Access to all operational areas would meet the requirements of the Americans with Disabilities Act.

Golden Gate Transit currently uses a site *at Eighth and Harrison Streets* for bus storage. Muni operations would be located on the curbs surrounding the temporary terminal block, with four drop-off bays (two of them trolley-ready) and four pick-up bays (all trolley-ready).

[5] Possible use of a new Terminal for a transit operator emergency control center has been proposed by the San Francisco Redevelopment Agency and may be evaluated in the future by the Transbay Joint Powers Authority.

**Figure 2.2 8: Layout of Temporary Bus Terminal**



Contra-flow lanes would be designed along Beale and Folsom Streets to accommodate right-hand drop-off and boarding for Muni. Golden Gate Transit would be allocated three bays on the curb with an additional four to five layover spaces on the north side of Folsom Street between Fremont and Beale Streets. During operation of the temporary terminal, SamTrans express bus service would operate via Mission, Beale, Folsom and Main Streets to an endpoint on Beale Street between Howard and Folsom, or as an alternative, on Main Street between Folsom and Howard. Buses would alight passengers at all bus stops prior to the endpoint. Leaving the endpoint, buses would be in service and stop at all bus stops for passenger boarding.

*In response to public comment regarding the need to reduce overall project costs, AC Transit bus access to the temporary terminal will no longer make use of a temporary bus ramp between the Bay Bridge and the temporary terminal during operation of the temporary facility. Without a temporary bus ramp, the AC Transit buses exiting the freeway would use local streets to gain access to the temporary terminal. Buses exiting the I-80 freeway would go north up Fremont from the Harrison Street ramp, turn east on Folsom and proceed eastbound toward the temporary terminal. For the return trips, there would be a contra-flow lane along Folsom from Main Street to Essex Street for buses exiting the terminal. Buses would then have a protected left-turn movement from Folsom onto Essex Street. Once on Essex, the buses would travel on a dedicated bus lane toward the freeway on-ramp. Northbound traffic lanes on Essex Street would be temporarily eliminated during operation of the temporary terminal to allow for the dedicated bus lanes leading south to the freeway.*

Construction of the new Transbay Terminal facilities would be staged to allow for development of the new terminal and ramps at approximately the same locations as the old terminal and ramps. Before commencement of construction of the new terminal and ramps, the following conditions are assumed:

- Caltrans would have completed construction of the proposed off-ramp from the Bay Bridge to Fremont and Folsom Streets.
- The existing Transbay Terminal access ramp over Fremont and Beale Streets would be removed

Construction would be phased to first construct the temporary terminals, with all associated infrastructure. This would enable bus operations to proceed unimpeded during construction. Upon completion of the temporary terminals, all bus operations would be removed from the existing Transbay Terminal. The existing terminal and access ramps would be demolished. Construction of the new terminal and access ramps would then commence in one large construction area.

### *2.2.2.4* Transbay Terminal Capital Costs

*Cost* estimates *shown in the Draft EIS/EIR* for the two Transbay Terminal Alternatives were: West Ramp Alternative *at* $1.02 billion and Loop Ramp Alternative *at* $1.19 billion *to start of construction assumed in the Draft EIS/EIR to be October 2002.* These estimates include the cost

of a train-ready basement, ramp development, the off-site bus storage facility, the temporary terminal, and the mid-point estimate for real estate. *Capital costs for the Transbay Terminal West Ramp Alternative (the Locally Preferred Alternative) have been refined and are shown in Table 2.2-1. These costs assume a refined construction schedule as shown in Figure 5.20-8, with all costs escalated to the actual year of expenditures.*

***Table 2.2-1: Transbay Terminal Capital Cost Estimate***
***West Ramp Alternative (LPA)***
***(Millions of Dollars – Year of Expenditure)***

| *Activity* | *Cost Estimate* |
|---|---|
| *Operations Analysis, Preliminary Engineering, Geotechnical Engineering), Program Review/Value Engineering, Final Design & Permitting, Owner Costs* | *$107.87* |
| *Acquire Property, Design, Construct Temporary Terminals (Transit and Greyhound)* | *$28.29* |
| *Acquire Property & Demolish Buildings to Build Terminal* | *$36.54* |
| *Demolish Existing Terminal & Ramps, Construct New Terminal & Ramps* | *$909.22* |
| *Construct Permanent Off Site Bus Storage Facility* | *$24.45* |
| ***TOTAL COST ESTIMATE*** | ***$1,106.37*** |

*Notes:*

- *Costs escalated to year of anticipated expenditure between 2004 and 2011.*
- *Costs are for West Ramp Alternative*
- *Other qualifications and assumptions apply, including coordination with Caltrans during the retrofit of the Western Approach and bus ramp retrofit projects.*
- *Total assumes high end of 2001 real estate estimate escalated to year of expenditure.*
- *Construction costs include a 25% construction contingency, 8% for construction management, and 10% project reserve. Owner costs are factored into each category.*

*Source: MTC, SMWM, Oppenheim/Lewis, Sedway Group, Parsons, 2003*

### *2.2.3* CALTRAIN DOWNTOWN EXTENSION ALTERNATIVES

The Caltrain Downtown Extension Component consists of an extension of Caltrain from the present San Francisco terminus (and storage yard) at Fourth and Townsend Streets to an underground terminal on the site of the present San Francisco Transbay Terminal at First and Mission Streets, a distance of some 1.3 miles. The extension would consist of two to four tracks branching to several additional tracks into the basement of the proposed new Transbay Terminal.

Two Caltrain Extension alternatives are under consideration (1) Second-to-Main, and (2) Second-to-Mission. *Both alternatives were refined in response to public comments on the Draft EIS/EIR. These revisions are shown in the Locally Preferred Alternative Report, (March 2003). Platform lengths and the length of straight (tangent) platforms were increased for both refined options, and additional through tracks were added to both. The lengths and number of tail tracks were also increased under both options. The refined alignments include three tracks*

*from the Fourth and Townsend Station through to the terminal. The Draft EIS/EIR included only two tracks for the tunnel portion between Townsend and Second Streets. The refined option includes a third track in this segment to improve rail operations and capacity. Additional train storage capacity was also provided by the refined tail track layouts for both options. Figure 2.2-9 shows the overall Second-to-Main Caltrain alignment – the Locally Preferred Alternative for the Caltrain component*

Figures 2.2-1*0* through 2.2-*18* show the plan and profiles for the Second-to-Main Street Alternative. Figures 2.2-1*0* through 2.2-1*4* and 2.2-*19* through 2.2-*22* show the plan and profiles for the Second-to-Mission Street Alternative.

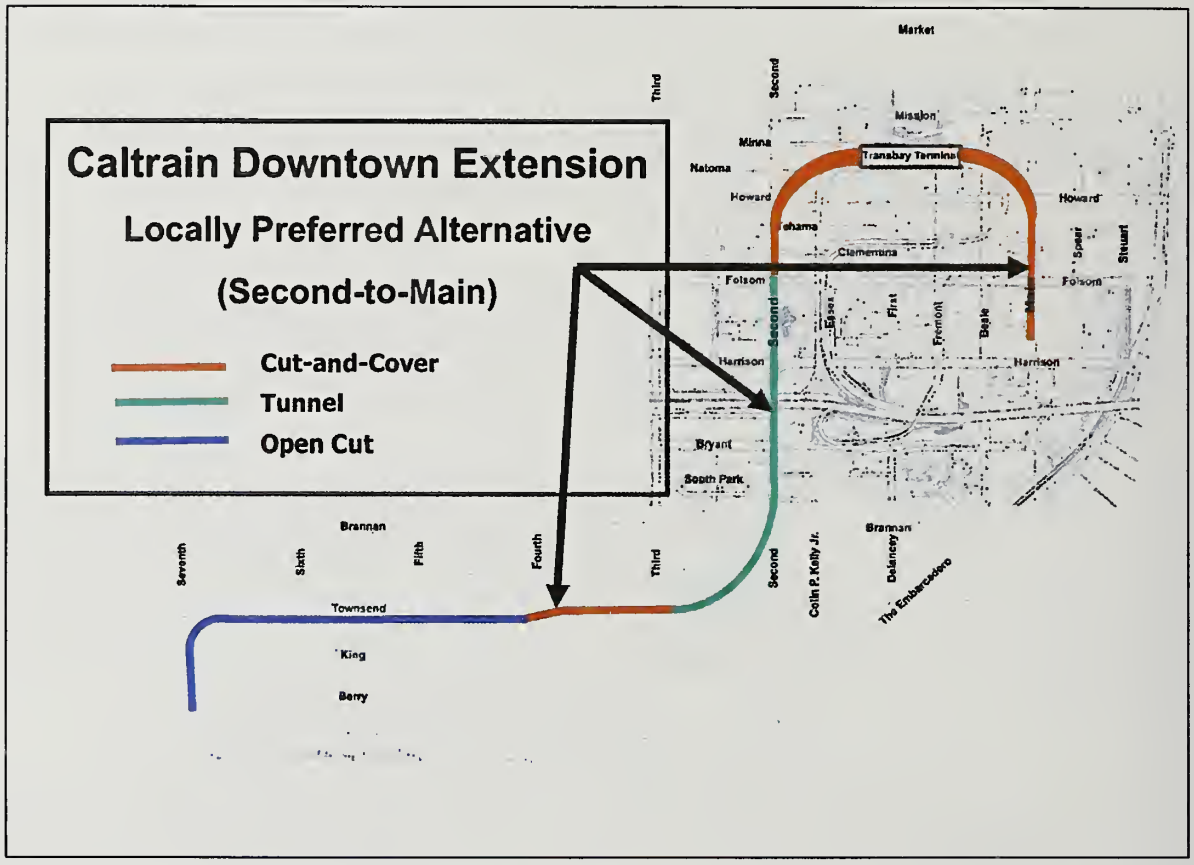
The extension would include reconstruction of the current storage yard at Fourth and Townsend, with provision of three surface platforms and six tracks on the southern portion of the existing facility near Fourth and King Streets and the addition of a new underground Caltrain station on the northern portion near Townsend and Fourth Streets.

The Caltrain Extension project would begin just north of Sixteenth Street, where additional tracks and sidings would be added as the alignment approaches the Fourth and Townsend location. Four Caltrain tracks are proposed to cross an extension of Common Street to the West.[6] From this location, the easternmost track would turn east into a reconstructed surface portion of the Fourth and Townsend storage facility and station. This track would then branch into six tracks leading to three surface platforms terminating at the current Fourth and Townsend Station (see Figure 2.2-13).

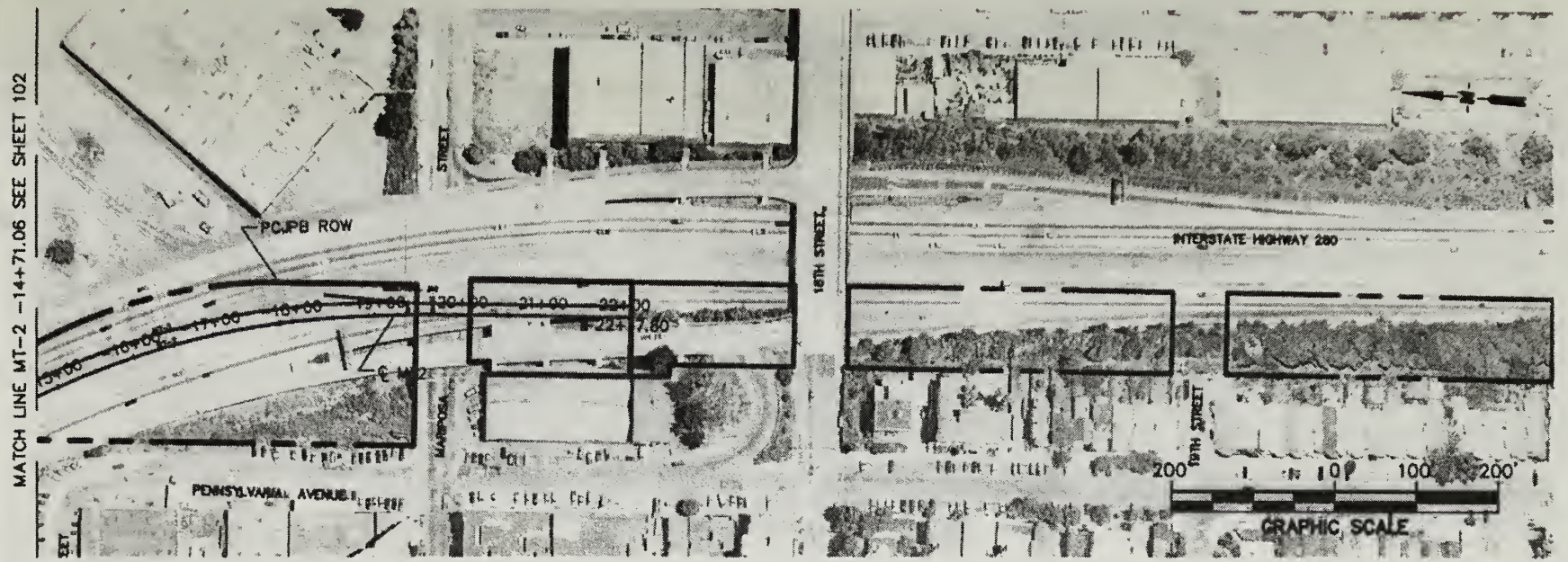
These tracks would not continue to the new Transbay Terminal but would terminate at the Fourth and Townsend Street Station. Platforms would be provided between these tracks for limited Caltrain service including, for example, special ballpark trains or non-electrified trains that could arrive from Dumbarton or from areas south of Gilroy, e.g., Monterey. The three westernmost tracks (closest to Seventh Street) at Common Street would begin to descend at approximately Berry Street and would curve east to a new underground station with a center platform near Fourth and Townsend Streets. These three tracks would lead to a new underground station at Fourth and Townsend, with two tracks serving a center-platform station (see Figures 2.2-1*3*). An additional fourth track coming from the East would pass north of these three tracks and the new underground platform. This fourth track would head to the west (toward Seventh Street) and would branch into five depressed storage tracks to be located to the south of Townsend Street between the new station platform and Seventh Street.

[6] The extension of Common Street across the Caltrain right-of-way was included in the Mission Bay Subsequent Environmental Impact Report (SEIR). A Notice of Determination was posted for this SEIR on November 3, 1998. The California Public Utilities Commission approved the new at-grade crossing on May 18, 2000 as a replacement for two crossing that were closed at Berry and King Streets in the Mission Bay development. The new Common Street crossing is therefore assumed as part of the No-Project Alternative for this Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project EIS/EIR.

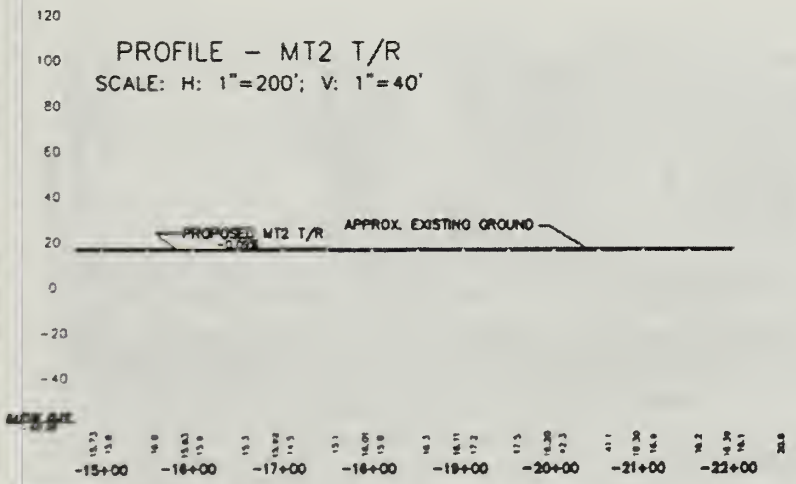
**Figure 2.2-9: Caltrain Downtown Extension**
**Second-to-Main Alternative – Locally Preferred Alternative**




The four tracks passing the Fourth and Townsend underground station would merge into two tracks under Townsend Street near Fourth Street. The alignment would then continue east under Townsend Street in a cut-and-cover tunnel configuration. It would then curve north at about Clarence Place just east of Third Street in a cut-and-cover configuration. For the current cut-and-cover option, eleven parcels with ten buildings would need to be acquired and demolished for this 1,100-foot long curve with 716- and 736-foot radii curves from Townsend to Second and Brannan Streets. (These buildings would remain for the tunneling option described below in Section 2.2.2.3.) The alignment would continue as a cut-and-cover section under Second Street for approximately 2,055 feet.




PLAN

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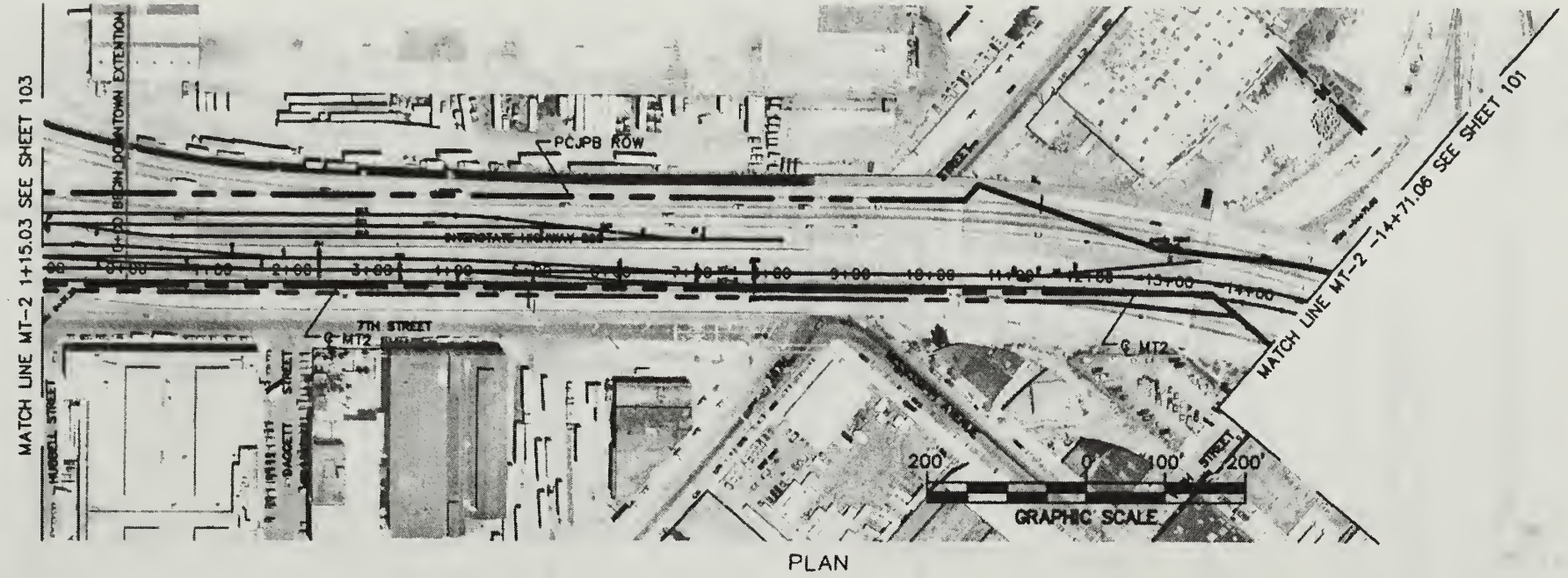
| SUBJECT TO CHANGE DURING FINAL DESIGN | | Figure 2.2-10 | PARSONS | PROJECT MANAGEMENT: | SAN FRANCISCO<br>CALTRAIN DOWNTOWN EXTENSION<br>2ND to MAIN and 2ND to MISSION<br>SHEET 1 of 9 | SCALE: 1" = 200' | |
| | | | | STRUCTURES: Z. AMARE | | CONTRACT NO: | MILEPOST: |
| | | | Caltrain | TRACK / CIVIL: B. SUSANTO | | DWG NO: 101 | REV: PAGE NO: |

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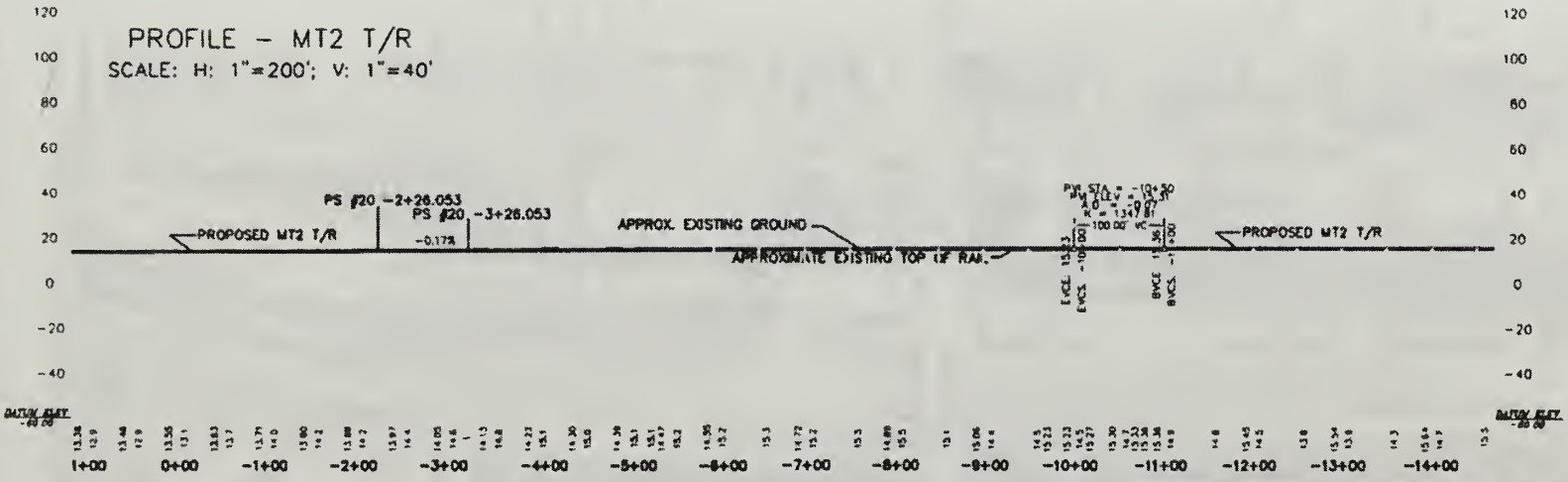


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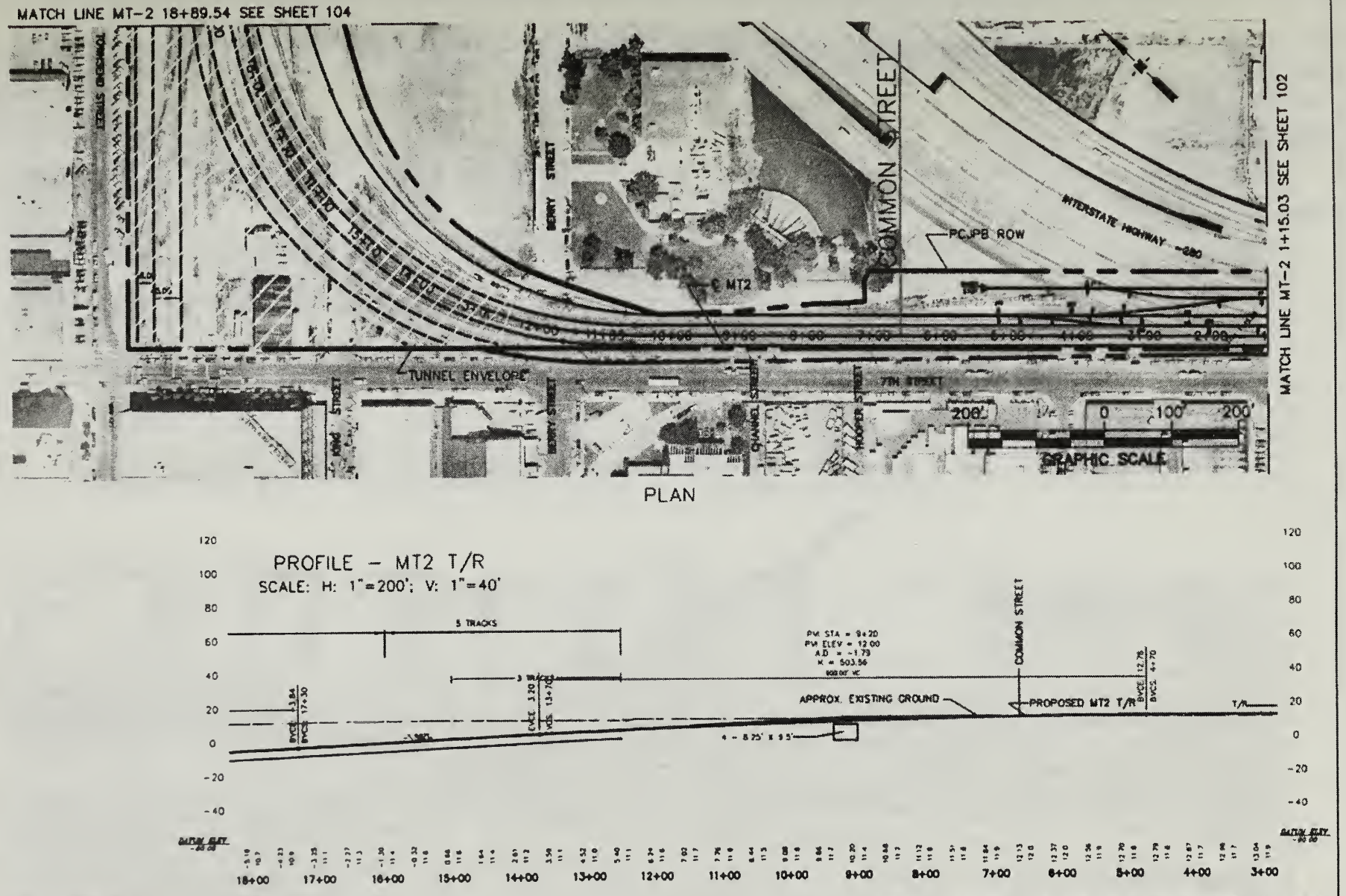
| DATE FLOWN: SEPTEMBER, 2000 | DESIGNED: J. TENNYSON | Figure 2.2-11 | PARSONS | Caltrain | CHIEF ENGINEER: D. MAKEY | PENINSULA CORRIDOR JOINT POWERS BOARD | CADD FILE NO: C-DTXI-B |
| SUBJECT TO CHANGE DURING FINAL DESIGN | DRAWN: J. SHIN | | | | PROJECT MANAGEMENT: | SAN FRANCISCO CALTRAIN DOWNTOWN EXTENSION 2ND to MAIN and 2ND to MISSION SHEET 2 of 9 | CADD DATE: 021902 |
| | CHECKED: D. MANSEN | | | | STRUCTURES: Z. AMARE | | SCALE: 1"=200' |
| | IN CHARGE: D. WEMMER | | | | TRACK / CIVIL: B. SUSANTO | | CONTRACT NO: |
| | DATE: | | | | | | SHEET NO: 102 |

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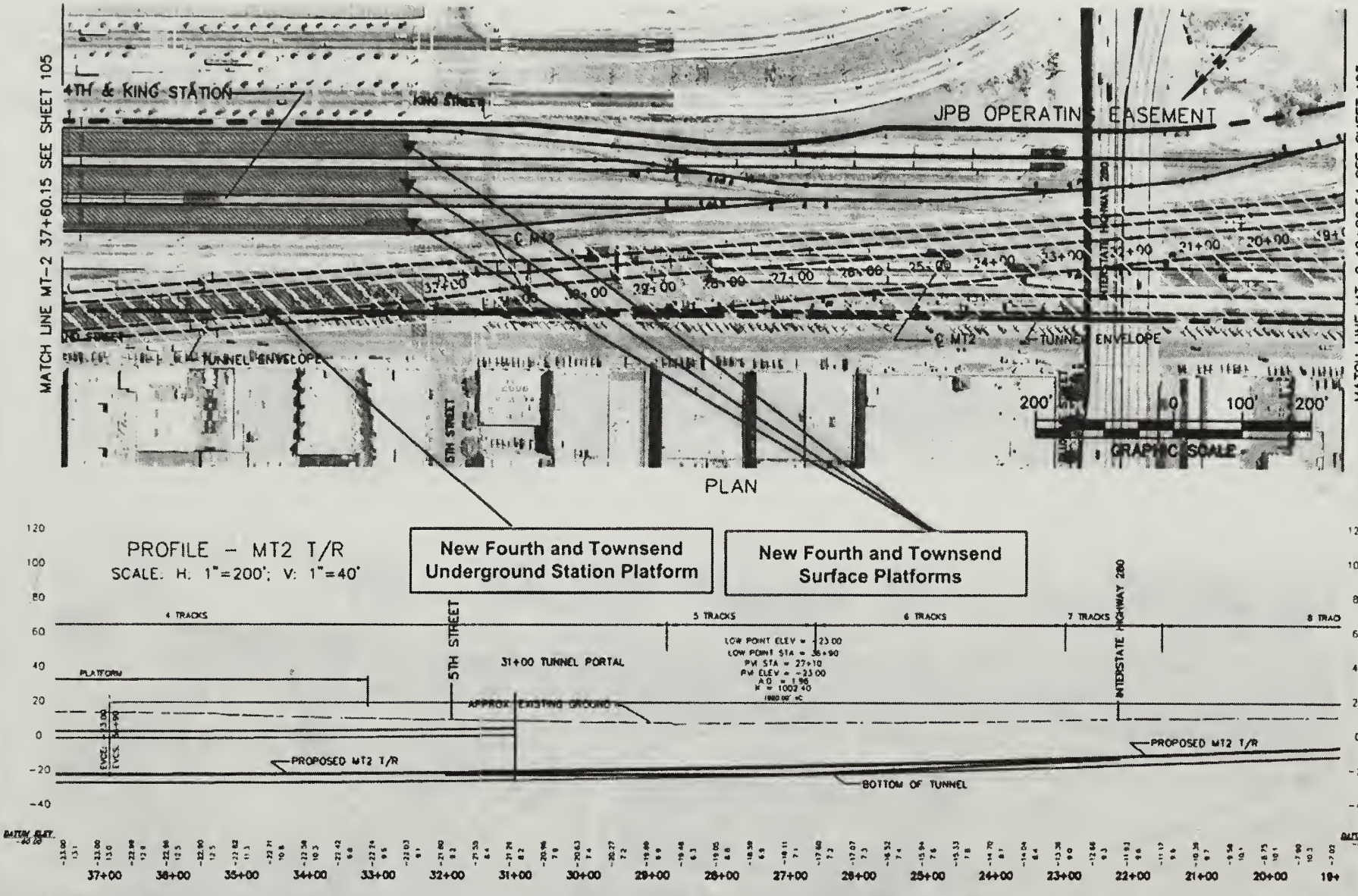
| DATE FLOWN SEPTEMBER, 2000 | J. TENNYSON | PARSONS | Caltrain | PENINSULA CORRIDOR JOINT POWERS BOARD | C-DTX1-B 021902 |
| SUBJECT TO CHANGE DURING FINAL DESIGN | J. SHIN | | | SAN FRANCISCO CALTRAIN DOWNTOWN EXTENSION 2ND to MAIN and 2ND to MISSION SHEET 3 of 9 | 1"=200' |
| | D. MANSEN | | | | |
| | D. WEMMER | | | | 103 |

Figure 2.2-12

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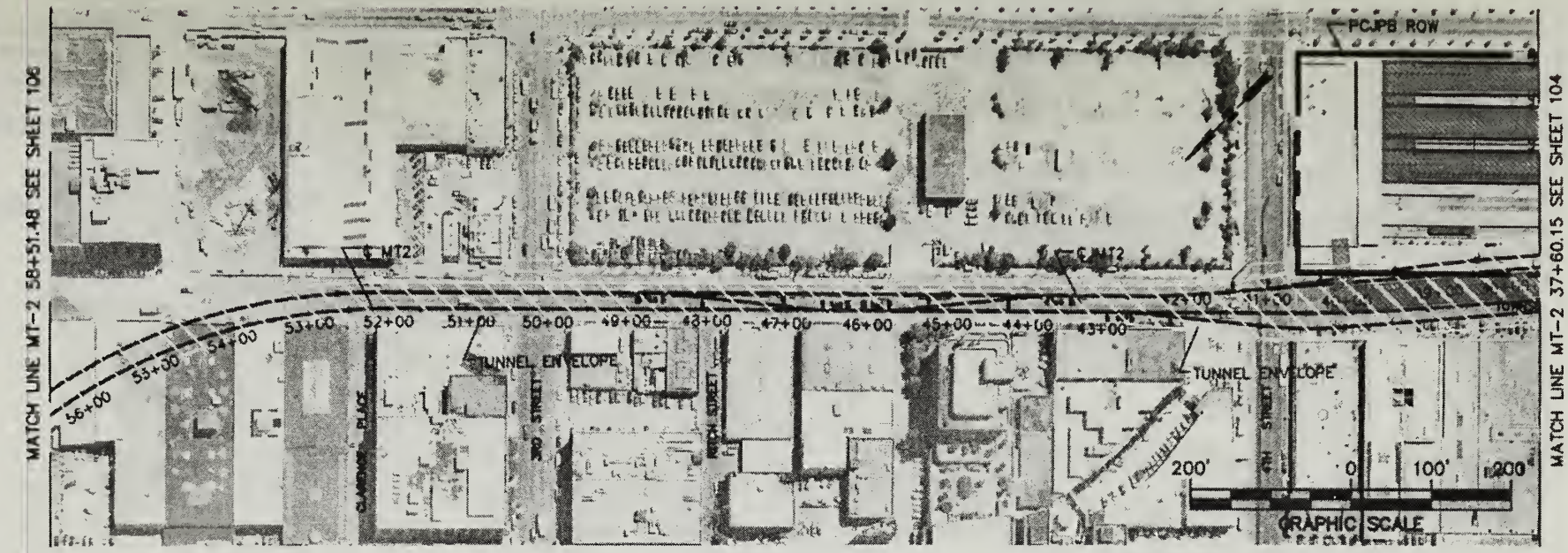
| DATE FLOWN: SEPTEMBER, 2000 | DESIGNED: J. TENNYSON; DRAWN: J. SHIN; CHECKED: D. MANSEN; IN CHARGE: D. KEMMER; DATE: | Figure 2.2-13 | CHIEF ENGINEER: D. MAXEY; PROJECT MANAGEMENT: Z. AMARE; TRACK / CIVIL: B. SUSANTO | PENINSULA CORRIDOR JOINT POWERS BOARD<br>SAN FRANCISCO<br>CALTRAIN DOWNTOWN EXTENSION<br>2ND to MAIN and 2ND to MISSION<br>SHEET 4 of 9 | CADD FILE NO: C-DTX1-B; CADD DATE: 021902; SCALE: 1" = 200'; DWG NO: 104 |

**SUBJECT TO CHANGE DURING FINAL DESIGN**

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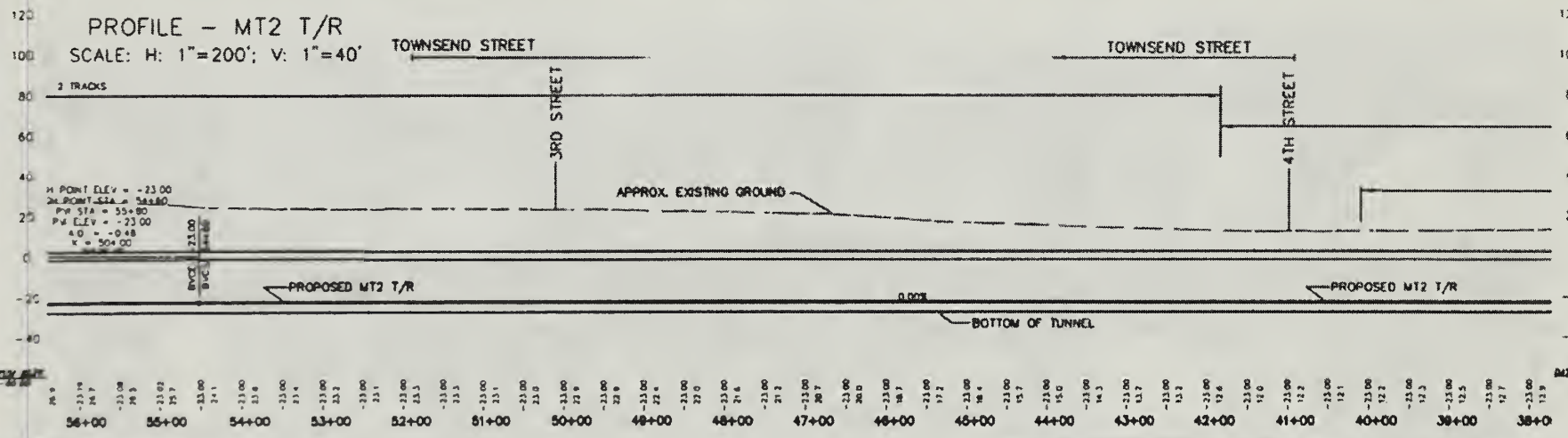


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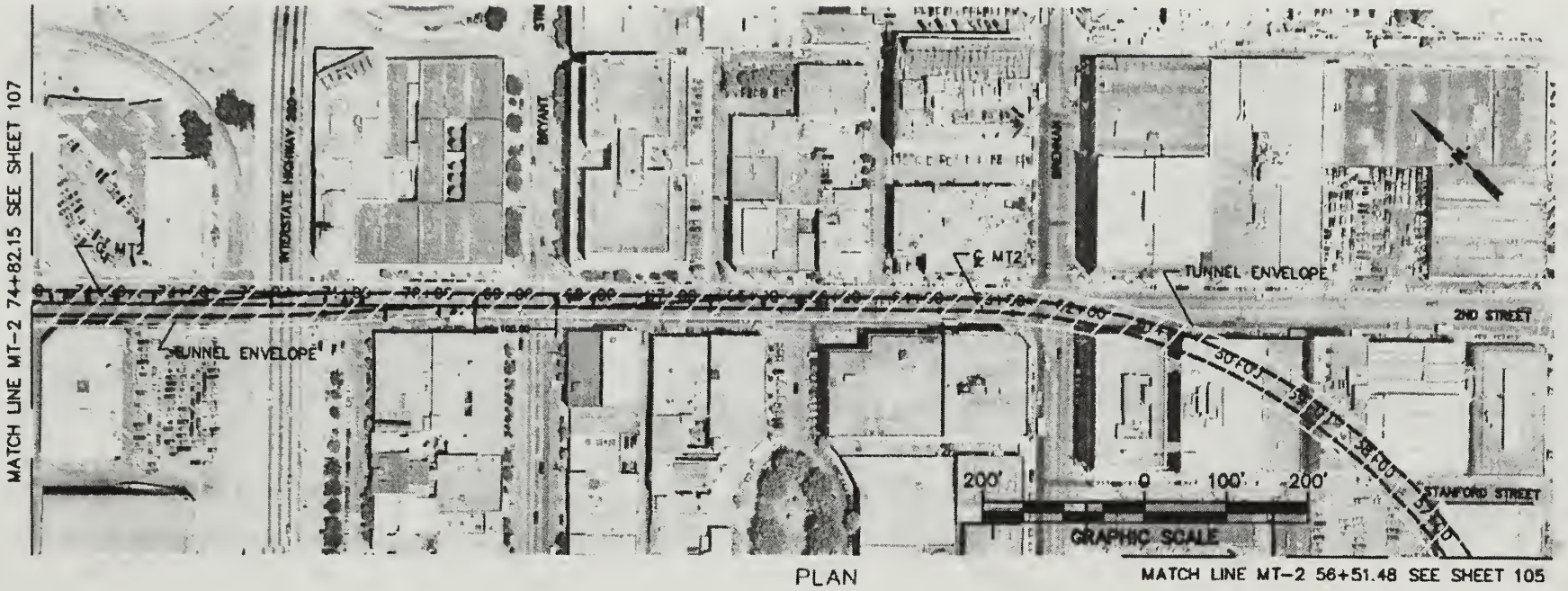
| DATE FLOWN: SEPTEMBER, 2000 | | | | CHIEF ENGINEER: D. MAXEY | PENINSULA CORRIDOR JOINT POWERS BOARD | CADD FILE NO: C-DTX1-B | CADD DATE: 021902 |
| SUBJECT TO CHANGE DURING FINAL DESIGN | Figure 2.2-14 | PARSONS | Caltrain | PROJECT MANAGEMENT: Z. AMARE<br>TRACK / CIVIL: B. SUSANTO | SAN FRANCISCO<br>CALTRAIN DOWNTOWN EXTENSION<br>2ND to MAIN and 2ND to MISSION<br>SHEET 5 of 9 | SCALE: 1"=200'<br>CONTRACT NO: | MILEPOST |
| | | | | | | DWG NO: 105 | REV / PAGE NO |

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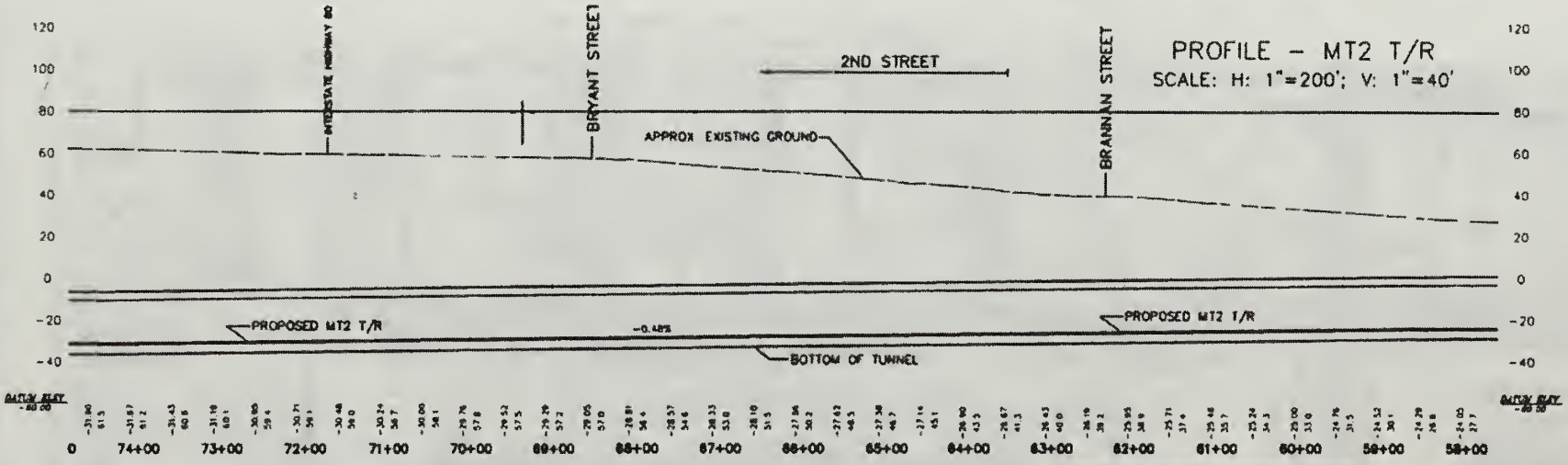


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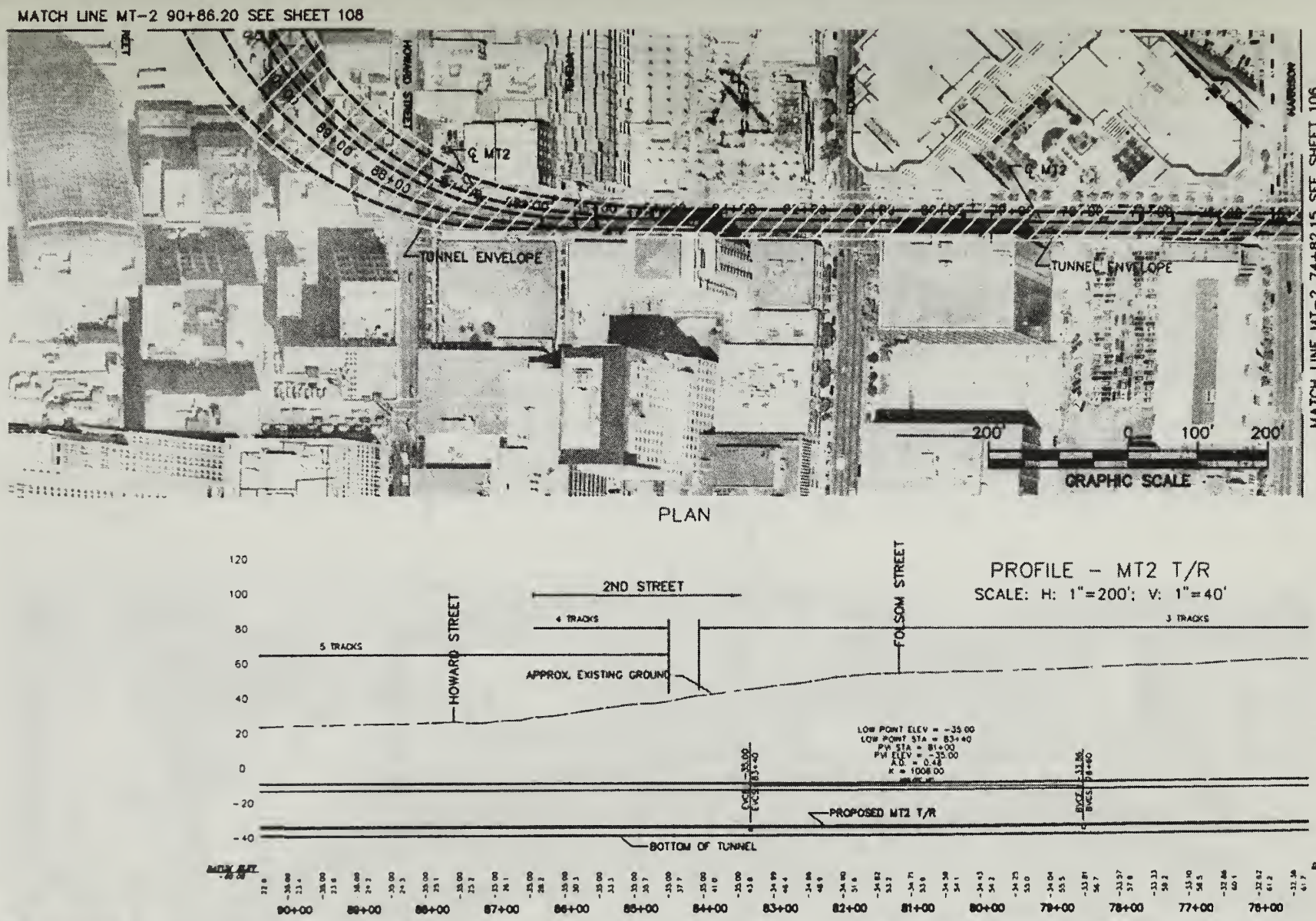
| DATE FLOWN: SEPTEMBER, 2000 | DESIGNED: J. TENNYSON; DRAWN: J. SHIN; CHECKED: D. MANSEN; IN CHARGE: D. WEMMER; DATE: | Figure 2.2-15 | PARSONS | CalTrain | CHIEF ENGINEER: D. MAREY; PROJECT MANAGEMENT: STRUCTURES: Z. AMARE; TRACK / CIVIL: B. SUSANTO | PENINSULA CORRIDOR JOINT POWERS BOARD<br>SAN FRANCISCO<br>CALTRAIN DOWNTOWN EXTENSION<br>2ND to MAIN<br>SHEET 6 of 9 | CADD FILE NO: C-DTX1-B; CADD SHEET NO: 021902; SCALE: 1"=200'; CONTRACT NO:; MILEPOST:; DRG NO: 106; REV:; PAGE NO: |

SUBJECT TO CHANGE DURING FINAL DESIGN

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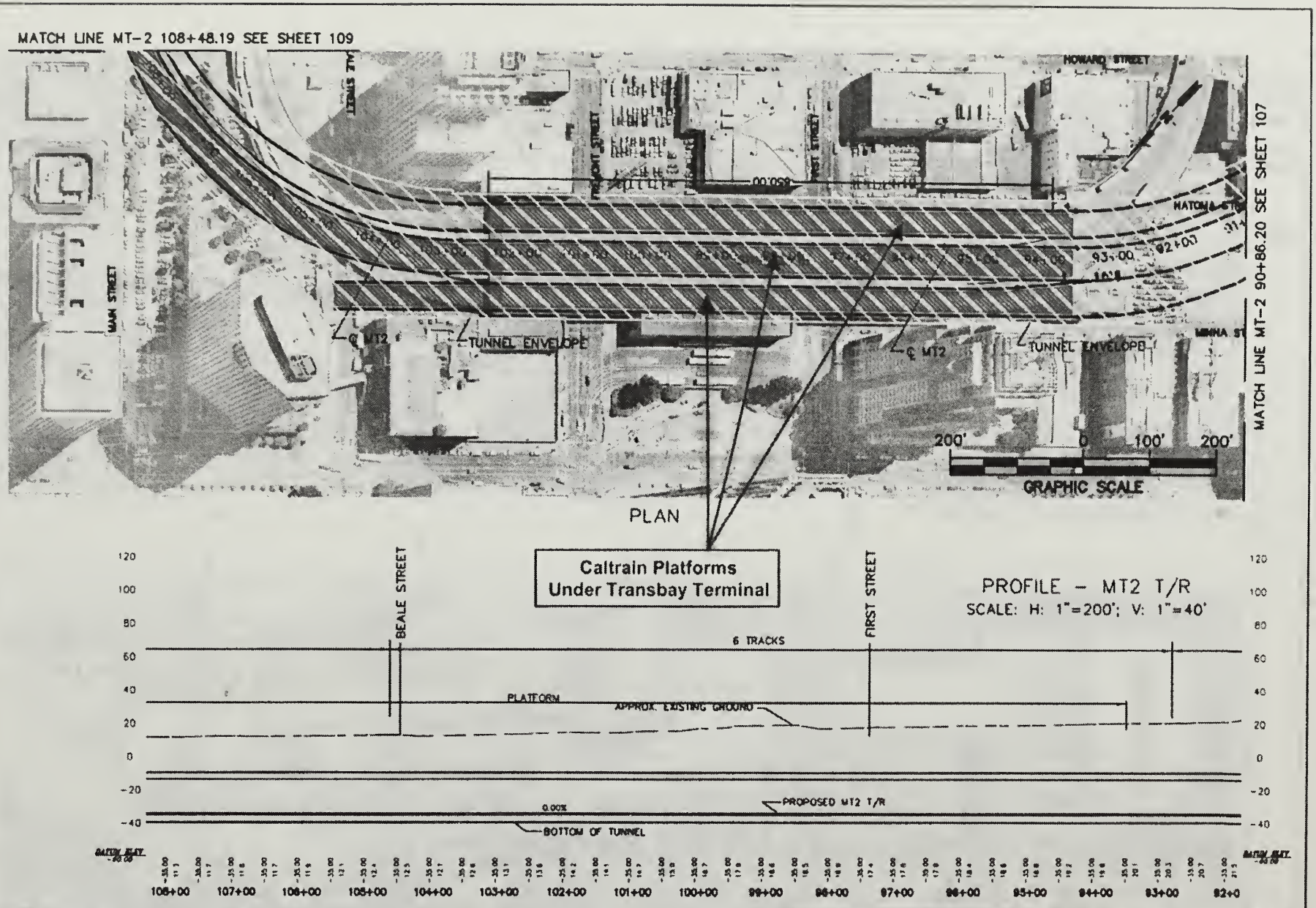
| DATE FLOWN SEPTEMBER, 2000 | J. TENNYSON | Figure 2.2-16 | PARSONS | Caltrain | PENINSULA CORRIDOR JOINT POWERS BOARD |
| SUBJECT TO CHANGE DURING FINAL DESIGN | J. SHIN | | | | SAN FRANCISCO CALTRAIN DOWNTOWN EXTENSION 2ND to MAIN SHEET 7 of 9 |
| | D. MANSEN | | | | |
| | D. WEMMER | | | | |

CHIEF ENGINEER: D. MAXEY
PROJECT MANAGEMENT
STRUCTURES: Z. AMARE
TRACK / CIVIL: B. SUSANTO
CADD FILE NO: C-DTX1-B
CADD DATE: 021902
SCALE: 1"=200'
CONTRACT NO
DWG NO: 107

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| DATE FLOWN: SEPTEMBER, 2000 | DESIGNED: J. TENNYSON; DRAWN: J. SHIN; CHECKED: D. MAHSEN; IN CHARGE: D. WEMMER; DATE: | Figure 2.2-17 | PARSONS | Caltrain | CHIEF ENGINEER: D. MAHEY; PROJECT MANAGEMENT: ; STRUCTURES: Z. AMARE; TRACK / CIVIL: B. SUSANTO | PENINSULA CORRIDOR JOINT POWERS BOARD<br>SAN FRANCISCO<br>CALTRAIN DOWNTOWN EXTENSION<br>2ND to MAIN<br>SHEET 8 of 9 |

SUBJECT TO CHANGE DURING FINAL DESIGN

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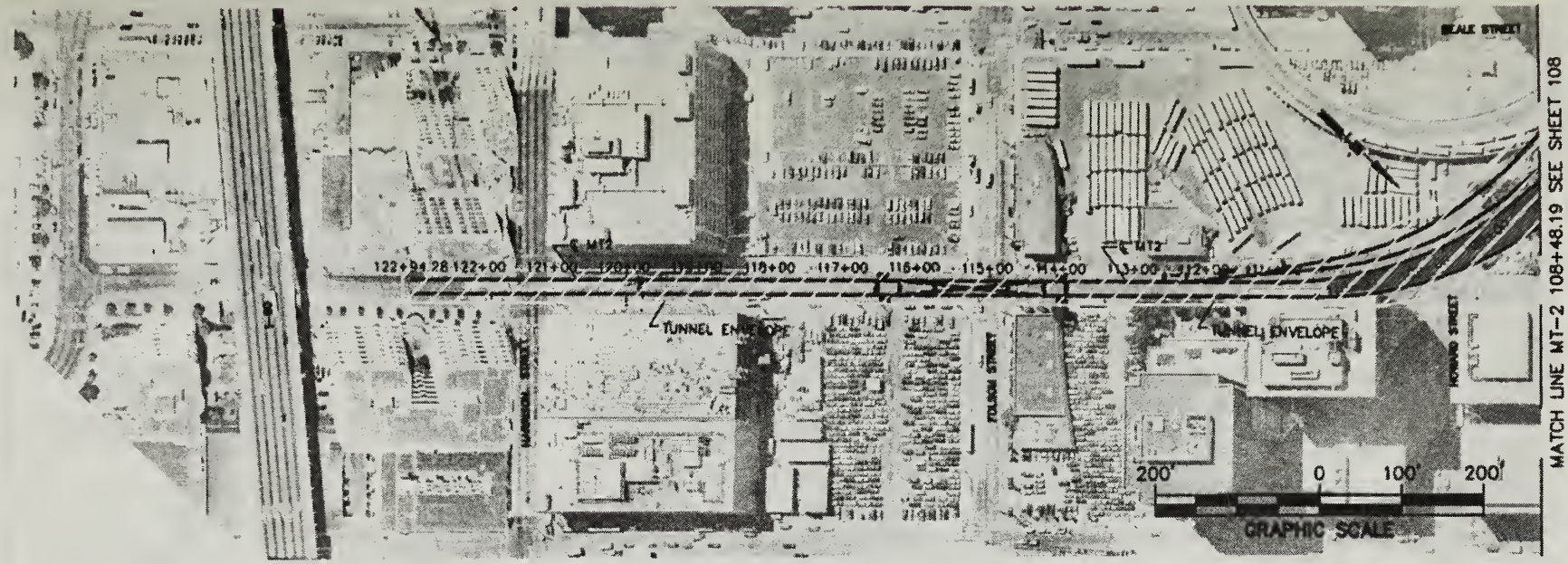
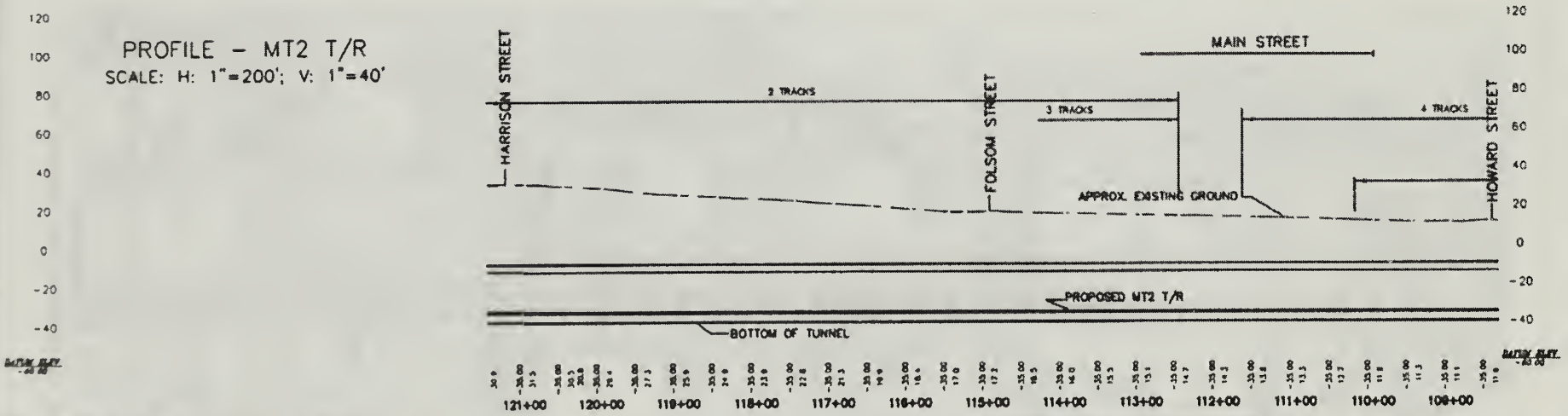



PLAN

PROFILE – MT2 T/R
SCALE: H: 1"=200'; V: 1"=40'

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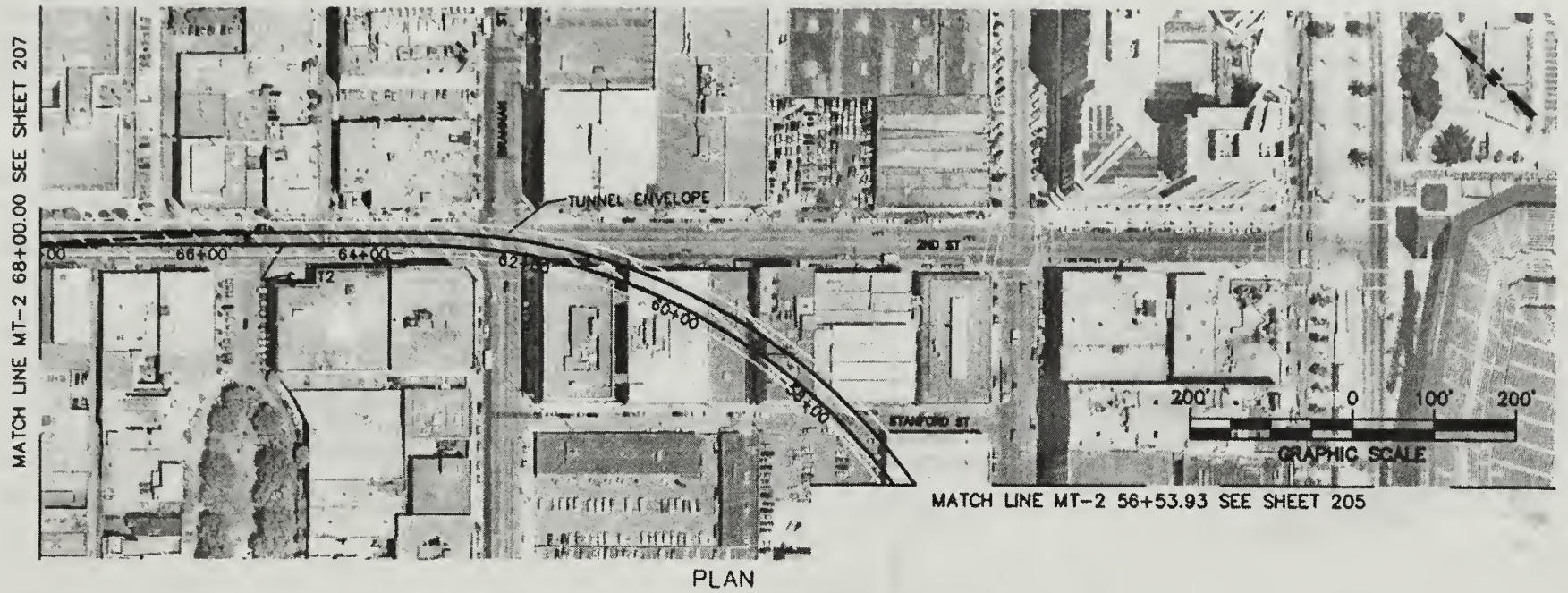
|---|---|---|---|---|---|---|---|
| DATE FLOWN: SEPTEMBER, 2000 | | | | | PENINSULA CORRIDOR JOINT POWERS BOARD | C-0TX1-8 | 021902 |
| SUBJECT TO CHANGE DURING FINAL DESIGN | | Figure 2.2-18 | PARSONS | Caltrain | SAN FRANCISCO CALTRAIN DOWNTOWN EXTENSION 2ND to MAIN SHEET 9 of 9 | 1"=200' | |
| | | | | | | 109 | |

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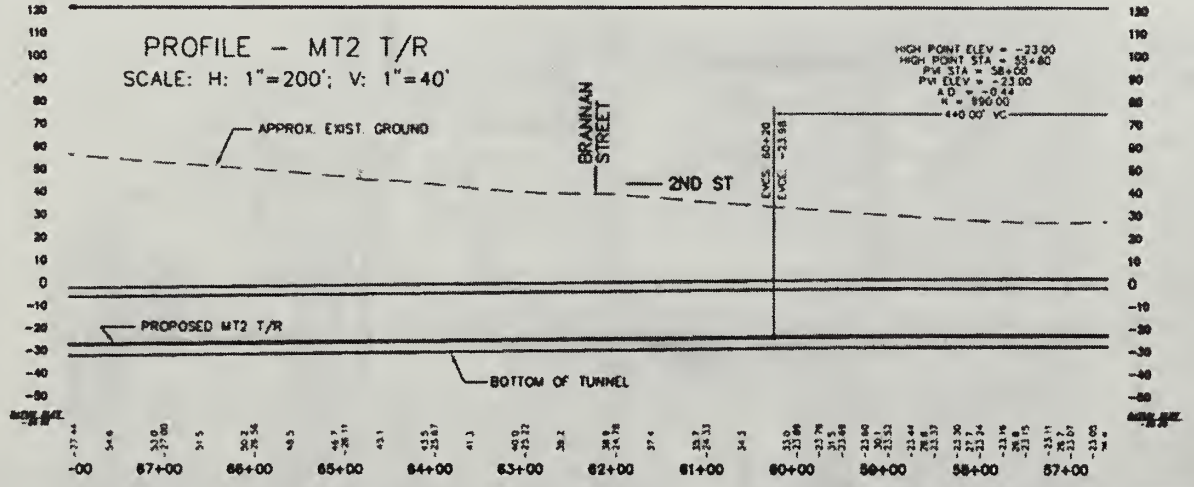


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| DATE FLOWN: SEPTEMBER, 2000 | DESIGNED: J. TENNYSON; DRAWN: K. LEI; CHECKED: D. MANSEN; IN CHARGE: D. WEAVER; DATE: | Figure 2.2-19 | PARSONS | Caltrain | CHIEF ENGINEER: D. MAXEY; PROJECT MANAGEMENT: ; STRUCTURES: J. FICARRA; ROAD / CIVIL: C. PAYNE | PENINSULA CORRIDOR JOINT POWERS BOARD<br>SAN FRANCISCO<br>CALTRAIN DOWNTOWN EXTENSION<br>2ND to MISSION<br>SHEET 6 OF 9 | CADD FILE NO: C-DTX2-B; CADD DATE: 022002; SCALE: 1"=200'; CONTRACT NO: ; MILEPOST: ; DWG NO: 206; REV: ; PAGE NO: |

SUBJECT TO CHANGE DURING FINAL DESIGN

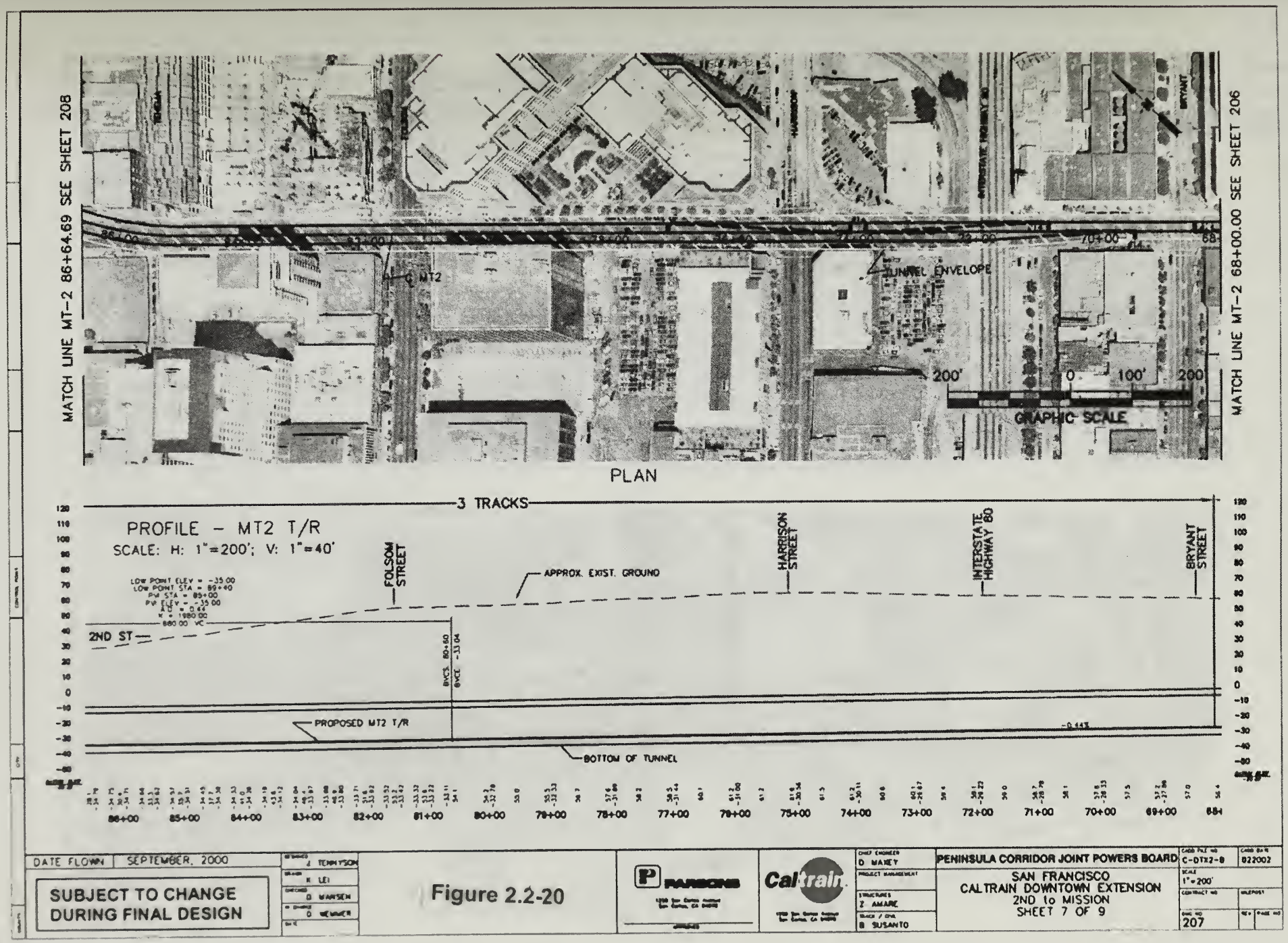
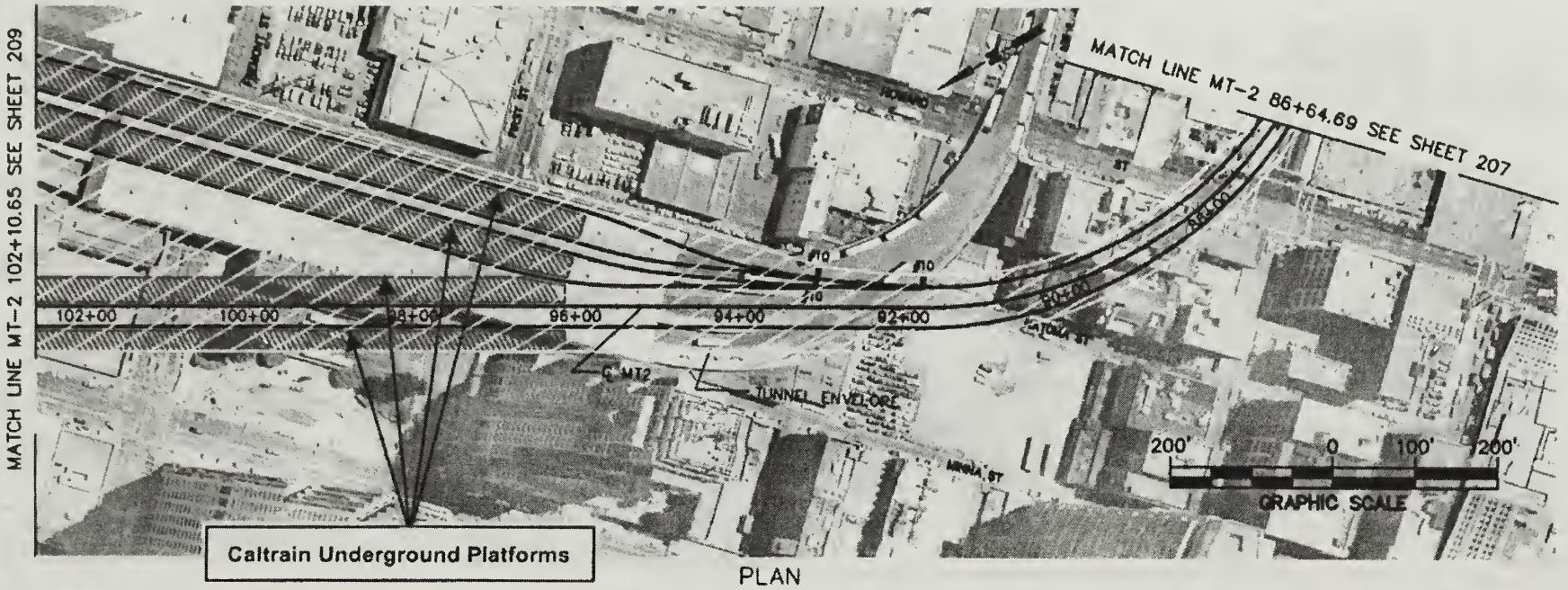
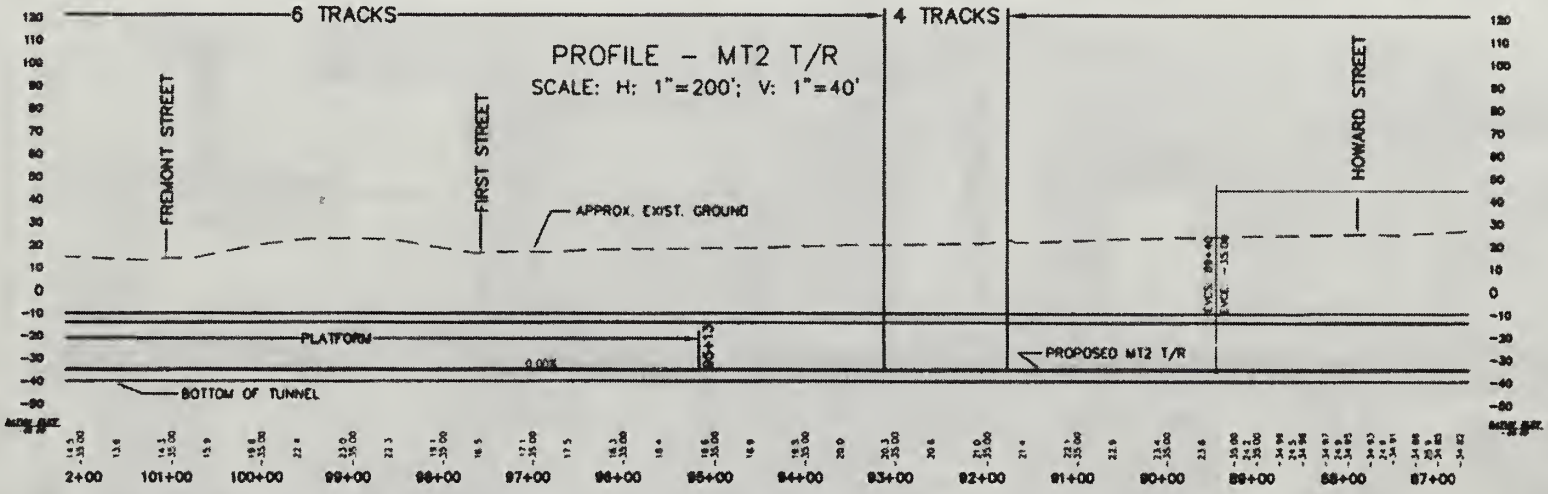

MATCH LINE MT-2 86+64.69 SEE SHEET 208
MATCH LINE MT-2 68+00.00 SEE SHEET 206
TUNNEL ENVELOPE
MT2
200'
0
100'
200
GRAPHIC SCALE
PLAN
3 TRACKS
PROFILE - MT2 T/R
SCALE: H: 1"=200'; V: 1"=40'
FOLSOM STREET
HARRISON STREET
INTERSTATE HIGHWAY 80
BRYANT STREET
APPROX. EXIST. GROUND
2ND ST
PROPOSED MT2 T/R
BOTTOM OF TUNNEL
86+00
85+00
84+00
83+00
82+00
81+00
80+00
79+00
78+00
77+00
76+00
75+00
74+00
73+00
72+00
71+00
70+00
69+00
68+
DATE FLOWN
SEPTEMBER, 2000
SUBJECT TO CHANGE DURING FINAL DESIGN
J. TENNYSON
K. LEI
D. MARSEN
D. WEMMER
PARSONS
Caltrain
D. MAKEY
Z. AMARE
B. SUSANTO
PENINSULA CORRIDOR JOINT POWERS BOARD
SAN FRANCISCO
CALTRAIN DOWNTOWN EXTENSION
2ND to MISSION
SHEET 7 OF 9
C-DTX2-B
022002
1"=200'
207

Figure 2.2-20

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| DATE FLOWN: SEPTEMBER, 2000 | DESIGNED: J. TENNYSON; DRAWN: K. LEI; CHECKED: D. MANSEN; IN CHARGE: D. WEMMER; DATE: | Figure 2.2-21 | PARSONS | Caltrain | CHIEF ENGINEER: D. MAHEY; PROJECT MANAGEMENT: Z. AMARE; STRUCTURES: B. SUSANTO | PENINSULA CORRIDOR JOINT POWERS BOARD<br>SAN FRANCISCO<br>CALTRAIN DOWNTOWN EXTENSION<br>2ND to MISSION<br>SHEET 8 OF 9 | CADD FILE NO: C-DTX2-B; CADD DATE: 022002; SCALE: 1"=200'; CONTRACT NO:; MILEPOST:; DWG NO: 208; REV:; PAGE NO: |

SUBJECT TO CHANGE DURING FINAL DESIGN

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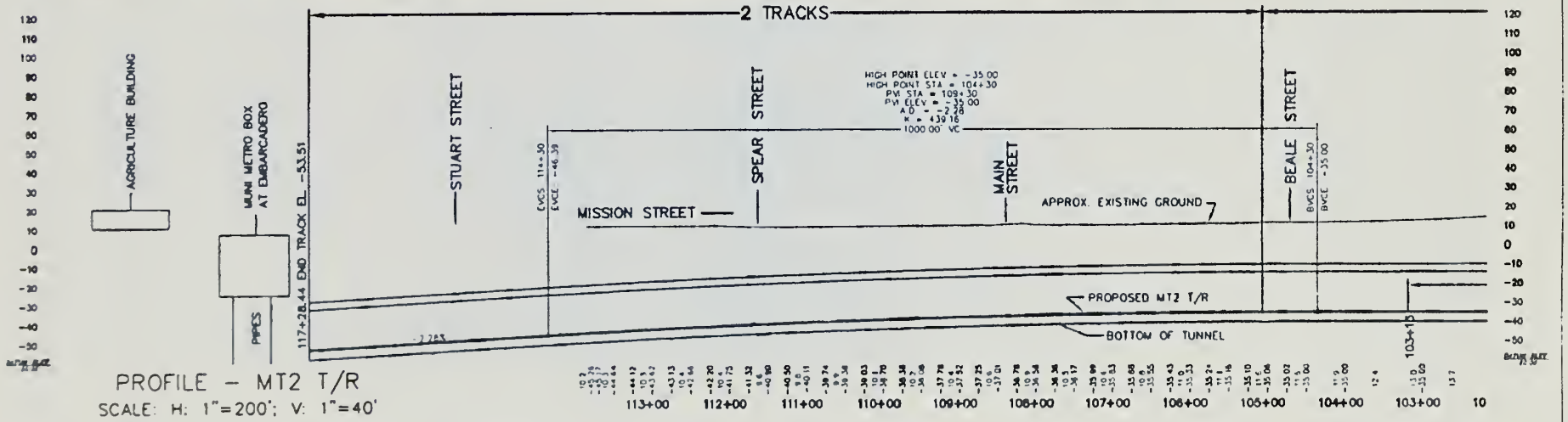


PROFILE – MT2 T/R

SCALE: H: 1"=200'; V: 1"=40'

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|---|---|---|---|---|---|---|---|
| DATE PLOTTED: SEPTEMBER, 2000 | DESIGNED J. TENNYSON | PARSONS | Caltrain | CHIEF ENGINEER D. MAXEY | PENINSULA CORRIDOR JOINT POWERS BOARD | DRAWING NO. C-01x2-B | CONTRACT NO. 022002 |
| SUBJECT TO CHANGE DURING FINAL DESIGN | DRAWN K. LEE | | | PROJECT MANAGEMENT | SAN FRANCISCO CALTRAIN DOWNTOWN EXTENSION 2ND to MISSION SHEET 9 OF 9 | SCALE 1"=200' | |
| | CHECKED D. WARSEN | | | STRUCTURES Z. AMARE | | CONTRACT NO. | MILEPOST |
| | IN CHARGE D. NEUMEIER | | | TRACK / CIVIL B. SUSANTO | | DWG NO. 209 | REV. |

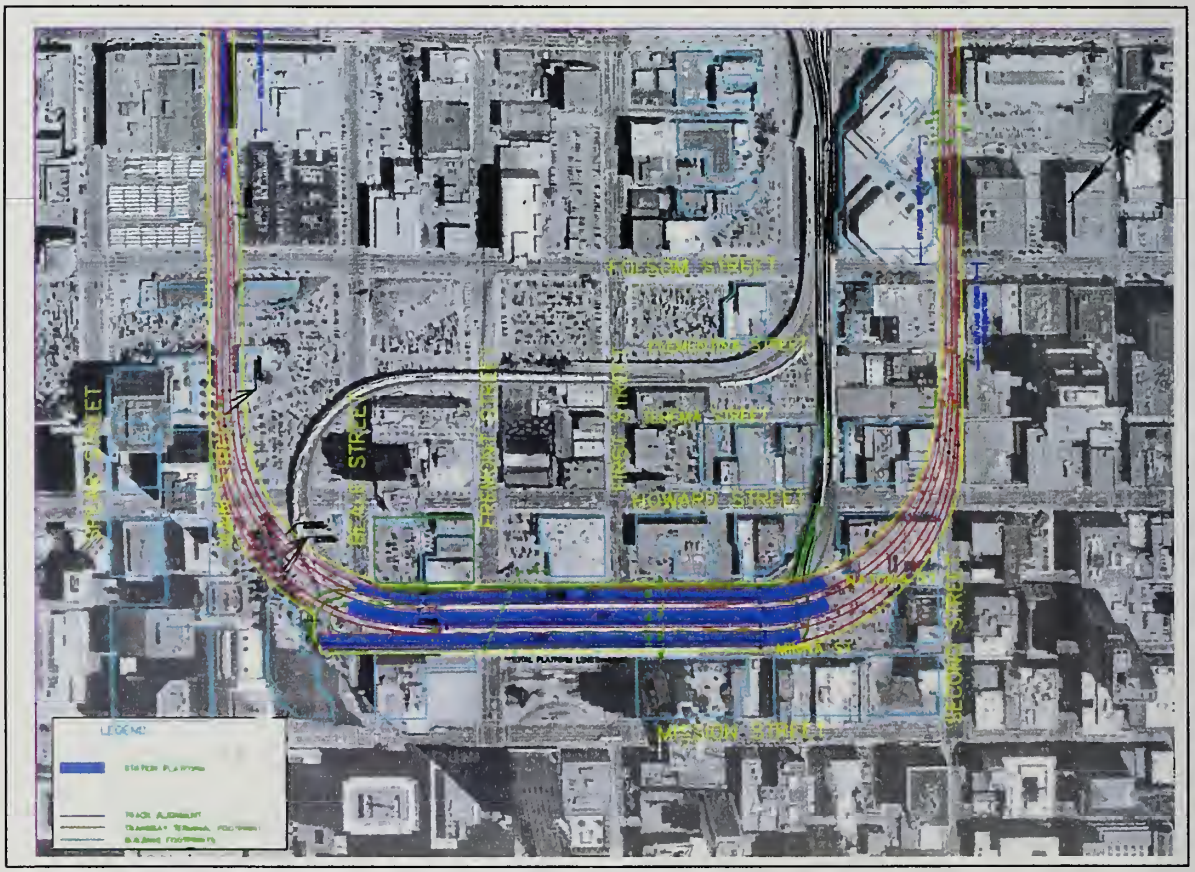
Figure 2.2-22

**As described below, two alternatives are under consideration from Howard Street north: (1) Second-to-Main, and (2) Second-to-Mission.**

### *2.2.3.1* Second-to-Main Caltrain Extension Alternative

*Figure 2.2-23 shows the refined Second-to-Main Alternative alignment as selected for the Locally Preferred Alternative.* As the Second-to-Main Caltrain Extension Alternative approaches Howard Street along Second Street, it would curve 90 degrees northeasterly, along an approximately 970-foot long curve with track curve radii of 498 to 545 feet into the basement of the new Transbay Terminal. Under current plans, *14* parcels of land with *11* buildings would need to be acquired and demolished for this curve into the Terminal.

*Figure 2.2-23: Caltrain Refined Second-to-Main Alternative – Locally Preferred Alternative*

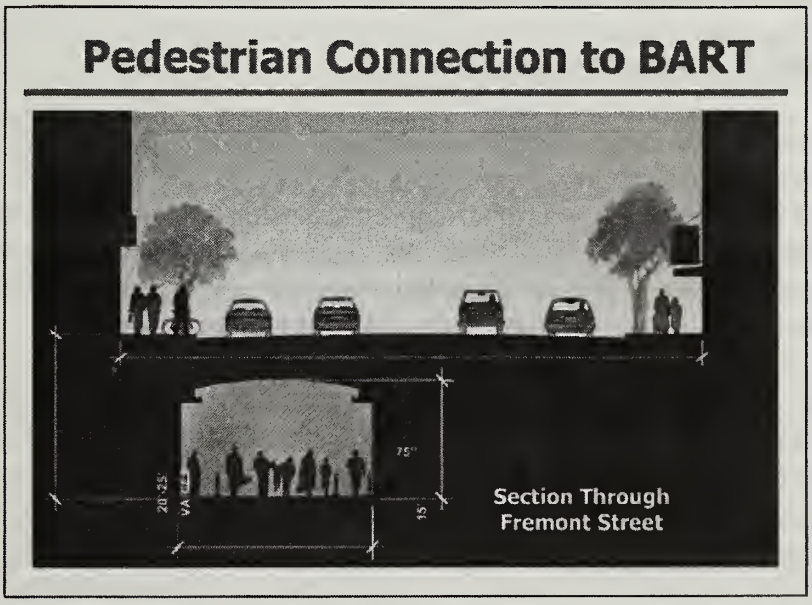



The terminal station would have six tracks and three platforms and would include approximately 2,000 feet of additional tracks (called tail tracks) in a cut-and-cover section leading from the east end of the new Terminal. These tracks would curve 90 degrees south along 498-foot to 521-foot

radius curves to Main Street and continue underneath Main Street to south of Folsom Street. The tracks would be used for temporary train storage, improving the operating efficiency of Caltrain service. Trains would not be required to be stored at Fourth and Townsend, but rather could be staged near the terminal to be brought quickly into service. This would minimize costly "deadheading" – the movement of trains that are not in revenue service. As shown on Figure *2.2-23, the proposed platform layout has been revised to maximize platform lengths to better accommodate long high-speed rail and commuter trains.* The *tail* tracks could also be extended as a separate, independent project at some time in the future, to a San Francisco-to-Oakland cross-bay alignment for commuter rail and/or high-speed trains.

This alternative would include a design option for a pedestrian connection underneath Fremont Street to the BART Embarcadero Station. The pedestrian connection would be below grade level and approximately 800 feet long. *Figure 2.2-24 shows a cross section for the proposed underground connection.*

***Figure 2.2-24: Pedestrian Connection to BART (Conceptual Cross Section)***




### *2.2.3.2* Second-to-Mission Caltrain Extension Alternative

The Second-to-Mission Alternative would follow the same alignment as the Second-to-Main Alternative up to Second and Howard Streets. At that point, it would provide a different configuration for the underground station in the Transbay Terminal and for the tail tracks leading out of the terminal.

As this alignment approaches Howard Street, rather than running parallel to the Terminal's long axis, this alignment would curve northeasterly at about Tehama Street, along a 1,432-foot radius

curve for approximately 700 feet, cutting diagonally under the new terminal and exiting out under Mission Street headed towards The Embarcadero. The southernmost track would branch into four tracks leading to and serving two center platforms directly under the Transbay Terminal. These four tracks would terminate at the eastern end of the Terminal. The two northernmost tracks would continue on an angle to Mission Boulevard and would serve two 600-foot side platforms to the north of the Transbay Terminal. These two tracks would continue to two 1,400-foot tail tracks under Mission Street ending just east of The Embarcadero. Under current plan, *20* parcels of land and 13 buildings would need to be acquired and demolished for this alternative. The tail tracks for this alignment would be used in a manner similar to the uses described above for the Second-to-Main Alternative, and could be extended as a separate, independent project at some time in the future to a San Francisco-to-Oakland cross-bay alignment for commuter rail and/or high-speed trains.

As with the Second-to-Main Alternative, this alternative would include a design option for a pedestrian connection underneath Fremont Street to the BART Embarcadero Station. The pedestrian connection would be below grade level and approximately 800 feet long.

### *2.2.3.3* Caltrain Extension Tunneling Option

Use of tunneling rather than cut-and-cover trenching was evaluated for constructing the Caltrain Downtown Extension Alternative, *and was selected as the Locally Preferred Alternative, as shown on Figure 2.2-9.* Given the geology along the Caltrain Extension alignments, tunneling appears to be feasible only for that portion of the alignments between Townsend Street and Folsom Street. This construction technique would involve the underpinning (additional support) of the buildings on the curve between Townsend and Second Streets.

Geology for this portion of the alignments is characterized as fractured rock. This geology is not suited for standard tunnel boring machines, so a highly specialized tunneling technique known as the "stacked drift" approach was evaluated. This approach, although more costly than most tunneling approaches, was selected to virtually eliminate the risk of tunnel collapse. Given that the proposed construction technique for tunneling has an extremely low likelihood of collapse or tunnel failure and given that buildings would be underpinned prior to construction, the buildings under which the tunnel would pass would not need to be vacated during the construction period.

### *2.2.3.4* Accommodation of High-Speed Rail

As shown on the plans and described in this section, the curves along the Caltrain Extension Alternatives all have radii greater than 493 feet, which is the minimum design curve radius for existing European (French and German) high-speed train equipment.[7] This minimum radius requirement was a critical factor for the placement of Caltrain alignment alternatives under Second Street. Specifically, the Second Street alignment allows for curves with radii greater

[7] Letter dated October 5, 2000 from Dan Leavitt, Deputy Director of the California High Speed Rail Authority to Maria Ayerdi, Transportation Policy Advisor, Office of the Mayor, City and County of San Francisco.

than 493 feet leading from Second Street into the Transbay Terminal for both Caltrain Alternatives.

### *2.2.3.5* Caltrain Capital Costs

*The Caltrain Downtown Extension costs shown in the Draft EIS/EIR* ranged from $844.3 million for the *Second*-to-Main Alternative/tunnel option to $912.9 million for the *Second*-to-Mission/cut-and-cover option *to start of construction assumed in the Draft EIS/EIR to be October 2002. Capital costs for the Second-to-Main Alternative Tunneling Option (the Locally Preferred Alternative) have been refined and are shown in Table 2.2-1. These refined costs assume a refined construction schedule as shown in Figure 5.20-8, with all costs escalated to the actual year of expenditures.*

**Table 2.2-1: Capital Cost Estimate for Caltrain Downtown Extension Second-to-Main Street Tunneling Option – Locally Preferred Alternative (Millions of Dollars – Year of Expenditure)**

| *Activity* | *Cost Estimate* |
|---|---|
| *Operations Analysis, Preliminary Engineering, Geotechnical Engineering, Program Review/ Value Engineering, Final Design & Permitting, Owner Costs* | *$76.83* |
| *Acquire Property & Demolish Buildings along Extension* | |
| *Acquisition/Relocation for Train Subway* | *$82.85* |
| *Demolition* | *$1.24* |
| *Resale Proceeds* | *($31.12)* |
| *Subtotal* | *$52.97* |
| *Design and Relocate Utility Lines along Extension* | *$52.97* |
| *Construct Surface Rail & Improvements at Train Yard* | *$13.37* |
| *Construct Cut-and-Cover and Retained-Cut – Caltrain Extension* | *$427.13* |
| *Reconstruct Streets* | *$7.09* |
| *Construct Train Tunnel* | *$287.70* |
| *Construct Track & Systems Facilities* | *$58.54* |
| ***TOTAL COST ESTIMATE – Caltrain Downtown Extension*** | ***$976.53*** |

*Notes:*

- *Costs escalated to year of anticipated expenditure between 2004 and 2011.*
- *Costs are for Second-to-Main Tunneling Alternative, the Locally Preferred Alternative.*
- *Total assumes high end of 2001 real estate estimate escalated to year of expenditure.*
- *Construction costs include a 25% construction contingency, 8% for construction management, and 10% project reserve. Owner costs are factored into each category.*
- *The optional underground pedestrian connection from the train mezzanine to The Embarcadero Muni Metro/BART Station is estimated to cost $45.3 million.*
- *An additional $235 million could need to be added to the Project costs for purchase of dual mode locomotives if the Caltrain corridor is not electrified.*

***Source:*** *Parsons, 2003*

*The optional underground pedestrian connection from the train mezzanine to The Embarcadero Muni Metro/BART Station is estimated to cost $45.3 million. An additional $235 million could need to be added to the Project costs for purchase of dual mode locomotives if the Caltrain corridor is not electrified. This number is dependent upon the size and timing of the procurement, and the salvage value of the current Caltrain locomotives. Please note that the proposed California High Speed Rail Program would also require electrification of the peninsula corridor.*

#### *2.2.3.6* Caltrain Operating Scenario Assumptions

For purposes of this EIS/EIR, it is assumed that Caltrain would operate *132* trains daily in the horizon year of 2020. Table 2.2-2 shows the operating assumptions used for analysis of ridership and operating costs.

**Table 2.2-2: Caltrain Operating Assumptions (Year 2020)**

| Time of Day | Type of Service *(Per period two-way)* | | | Trains Per Day (Two-way) |
|---|---|---|---|---|
| | Local | Limited | Express | |
| **Early am** *5 – 6 am* | *7* | *0* | *2* | *9* |
| ***AM Peak*** *6-9 am* | *15* | *7* | *12* | *34* |
| **Off Peak** 9 am to 4 pm | *29* | *1* | *2* | *32* |
| ***PM Peak*** *4-7 pm* | *14* | *8* | *12* | *34* |
| **Night** 7 pm to midnight | *21* | *0* | *2* | *23* |
| **Total** *5 am to midnight* | *86* | *16* | *30* | *132* |

**Source**: Peninsula Corridor Joint Powers Board *and HNTB, 2003*

### *2.2.4* PROPOSED TRANSBAY REDEVELOPMENT PLAN AREA

A plan for the redevelopment of the greater Transbay Terminal area has been a long-standing goal of the City and County of San Francisco, which entered into the redevelopment implementation process in December 1994 when the Board of Supervisors adopted a formal redevelopment survey area. A Citizen's Advisory Committee was formed which, along with local and regional agencies, has assisted the Redevelopment Agency in defining the redevelopment area. Additional planning and consensus building during the 1997 environmental process for the Caltrain Extension and the 2000 Terminal Study has resulted in the currently

proposed redevelopment area that is an integral part of the creation of a new Transbay Terminal and the extension of Caltrain.

Any of the project alternatives would require adoption of a redevelopment plan, new zoning and design guidelines, and a capital improvement plan. Several documents are to be prepared to develop these plans. This EIS/EIR document initiates but does not complete development of the plan. Documents to be prepared fall into three categories: (1) Redevelopment Plan to be adopted by the Redevelopment Commission and Board of Supervisors and signed by the Mayor, (2) a Design for Development to be approved by the Redevelopment Commission and Planning Commission, and (3) Planning Code and zoning map amendments. Redevelopment plan adoption documents include a Redevelopment Plan, a Preliminary Report, and a Final Report. Both the Preliminary Report and the Final Report will include all documents required per California Community Redevelopment Law for a redevelopment plan adoption.

Plan preparation will include the following activities: (1) analysis of the blight conditions in the area, (2) review of the financial feasibility of the entire project, (3) preparation of tax increment revenue projections for the area, and (4) evaluation of approaches for disposition and development of property within the Redevelopment Area. The Redevelopment Plan will be adopted by the San Francisco Redevelopment Commission and the San Francisco Board of Supervisors.

*A Draft Transbay Redevelopment Project Area Design for Development Vision was released for public review in August 2003, and is discussed in Section 2.4.1.3 below.* The *Final* Design for Development would be approved (not adopted) by the San Francisco Redevelopment Agency (SFRA) Commission and the San Francisco Planning Commission *at the time the Redevelopment Plan is proposed for adoption.*

### *2.2.4.1* Transit-Oriented and Other Redevelopment in the Transbay Terminal Area

Two development scenarios are being evaluated for the Redevelopment Plan Area, as described below. Assumed development levels for the "full build" and "reduced scope" development alternatives are shown in Table 2.2-3 and on Figure 2.2-25. The scenarios are not actual proposals but a representation of the range of reasonable development that could occur. Within the overall redevelopment plan, actual development proposals would be defined and evaluated in subsequent steps of the redevelopment process.

Transit-oriented development in the vicinity of the Transbay Terminal would provide a mix of residential and commercial development adjoining a major multi-modal transportation facility. Revenues from the sale or lease of the land plus proceeds based on tax-increment from development on the properties in the Redevelopment Area would be used to defray a portion of the costs for the new Transbay Terminal and Caltrain Downtown Extension. Publicly-owned properties proposed for possible development are shown in Figure 2.2-25.

**Table 2.2-3: Levels of Redevelopment (Gross Square Feet, GSF) Full Build and Reduced Scope**

| Proposed Uses | Block Numbers | | | | | | | | | Total (GSF) |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3718 | 3720 | 3736 | 3737 | 3738 | 3739 | 3740 | 3749 | 3764 | |
| **Residential** | | | | | | | | | | |
| Full Build (No. of D.U.) | 0 | 0 | 611,910 (510) | 1,068,210 (890) | 1,170,450 (975) | 1,758,375 (1,465) | 637,020 (531) | 234,325 (195) | 121,520 (101) | 5,601,810 (4,667) |
| Reduced Scope (No. of D.U.) | 0 | 0 | 712,800 (594) | 760,290 (634) | 875,160 (729) | 878,400 (732) | 697,400 (581) | 131,075 (109) | 60,760 (51) | 4,115,885 (3,430) |
| **Office** | | | | | | | | | | |
| Full Build | 787,230 | 0 | 0 | 0 | 0 | 397,360 | 0 | 0 | 0 | 1,184,590 |
| Reduced Scope | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Hotel** | | | | | | | | | | |
| Full Build | 0 | 475,600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 475,600 |
| Reduced Scope | 0 | 350,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 350,000 |
| **Retail** | | | | | | | | | | |
| Full Build | 61,205 | 11,600 | 29,985 | 38,690 | 50,050 | 98,935 | 30,780 | 25,475 | 8,680 | 355,400 |
| Reduced Scope | 0 | 12,000 | 30,800 | 38,715 | 57,860 | 58,400 | 34,900 | 18,725 | 8,680 | 260,080 |
| **Total** | | | | | | | | | | |
| **Full Build** | **848,435** | **487,200** | **641,895** | **1,106,900** | **1,220,500** | **2,254,670** | **667,800** | **259,800** | **130,200** | **7,617,400** |
| **Reduced Scope** | **0** | **362,000** | **743,600** | **799,005** | **933,020** | **936,800** | **732,300** | **149,800** | **69,440** | **4,725,965** |

Source: San Francisco Redevelopment Agency, San Francisco Planning Department

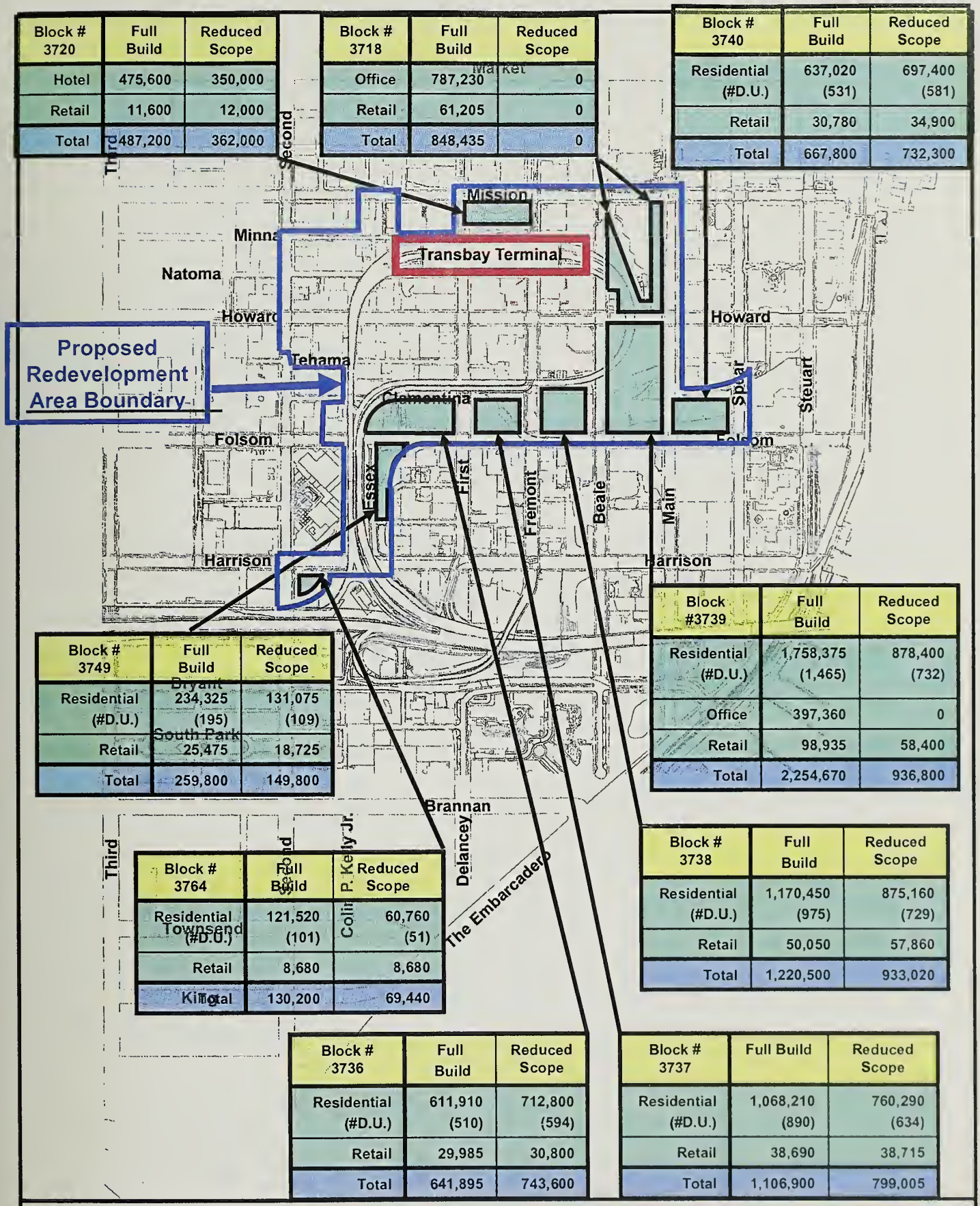



**Figure 2.2-25: Development Levels Assumed for Full Build & Reduced Scope Redevelopment Alternatives & Proposed Redevelopment Area Boundary**

The adoption of a Redevelopment Plan for the area in the general vicinity of the proposed new Transbay Terminal is proposed to aid in the revitalization and enhancement of the Terminal area and to facilitate related development and financing of the transportation improvements and other redevelopment projects, including office, retail, hotel, and residential development. Transbay Redevelopment Project Area boundaries *were revised to better recognize blighted areas and develop tax increment financing options. The proposed boundaries* are *also* shown on Figure 2.2-25.

**Full Build Development Scenario.** As shown on Table 2.2-4, the "full build" development scenario assumes about 7.6 million square feet (sq. ft.) of residential/office/retail/hotel development, including approximately 5.6 million sq. ft. of residential development (4,700 residential units including affordable housing), 1.2 million sq. ft. of office development, 475,000 sq. ft. of hotel development, and 355,000 sq. ft. of retail development.

**Reduced Scope Development Scenario.** As shown on Table 2.2-4, the "reduced scope" development scenario assumes a lesser amount of commercial and retail development and is weighted more toward housing. It assumes approximately 4.7 million sq. ft. of residential/office/retail/hotel development, including 4.1 million sq. ft. of residential (about 3,400 dwelling units), 350,000 sq. ft. of hotel development, and 260,000 sq. ft. of retail development. No office development is assumed for this Alternative.

### *2.2.4.2 Draft Transbay Redevelopment Project Area Design for Development Vision*

*The following program for the proposed Transbay Redevelopment Project Area was created through the Redevelopment Agency's design for development process. The program is described in more detail in the Draft Transbay Redevelopment Project Area Design for Development Vision (August 2003) document.*

*Working with members of the community during three public workshops, the Agency developed a refined program within the broad framework set forth in the "full build" and "reduced scope" alternatives of the Draft EIS/EIR. Based on community input from the public workshops and the comments to the Draft EIS/EIR, the refined program reduces the number of new residential towers in the proposed Project Area. Instead of a "wall of new development," as described by comments on the Draft EIS/EIR for the Full Build Alternative above, the refined program includes fewer, more slender towers far enough apart to protect sunlight, open space, and views within the new Transbay neighborhood.*

*The refined program also incorporates additional public improvements within the proposed Project Area, including new neighborhood parks, new public plazas, new pedestrian-oriented alleyways, and widened sidewalks.*

*The final Design for Development will be a public document that provides a set of architectural and urban design standards and guidelines for new development, open spaces and streetscapes*

*in the proposed Project Area. The program described below is still being refined through the Redevelopment Agency's continuing design for development process and ongoing community outreach.*

***Land Use***

*The Draft Design for Development document includes a land use program for the proposed Project Area, as shown in Figure 2.2-26. The area immediately surrounding the new Transbay Terminal is proposed as predominantly office uses, with some hotel and residential uses. The predominance of office uses north of Mission Street makes this part of the proposed Project Area appropriate for additional office development. The development parcels along Folsom Street and south of Howard Street between Main and Beale Streets are proposed to be predominantly residential uses. The proximity of Folsom Street to Rincon Hill and The Embarcadero makes this part of the proposed Project Area appropriate for additional residential development.*

*Folsom Street and portions of Beale Street would also be the focus of ground-floor retail development serving the new Transbay neighborhood as well as the existing Rincon Hill neighborhood. To respect the existing historic districts to the west of the Transbay Terminal, the area along Second Street would be a mixed-use district with commercial and residential development.*

***Urban Form – Residential***

*The draft vision includes an urban form program described in detail in Appendix F of this Final EIS/EIR. While the "full build" alternative includes approximately 4,700 residential units, this level of development would create a virtual wall of residential towers along Folsom Street and north of Folsom Street between Main and Beale Streets. Based on community input from the public workshops, the number of residential towers was reduced and would include fewer, taller towers surrounded by low-rise development between four and eight stories in height. The spacing between the towers is intended to protect sunlight, open space, and views within the proposed Project Area.*

*The draft program includes approximately 3,200 new residential units on the publicly owned development parcels, including several smaller, underutilized adjacent parcels. In addition to the development on publicly owned parcels, residential development would be encouraged and facilitated in the mixed-use zones of the proposed Project Area. It is intended that this new development retain the existing historic character of the neighborhood.*

***Urban Form – Office/Retail***

*The proposed program includes new office development on two publicly owned parcels and a new hotel development on the publicly owned parcel just north of the new Transbay Terminal. This hotel would be designed to serve high-speed rail passengers using the new Terminal as well as the larger downtown area. The program includes approximately 40,000 square feet of*

*ground-floor retail space concentrated in the residential area along Folsom Street. This new retail space will serve future residents of Transbay as well as existing residents in Rincon Hill.*

**Figure 2.2-26: Draft Design for Development Land Use Plan**

*During the development of the Redevelopment Agency's Draft Transbay Redevelopment Project Area Design for Development Vision released in August 2003 (and discussed in Section 2.4.1.3), differing height and bulk schemes were evaluated within the redevelopment plan area, including an 800-foot tall structure adjacent to the proposed new Transbay Terminal. However, these schemes are not being pursued at this time. In the event that the Transbay Redevelopment Project Area Design for Development Vision is revised by the Redevelopment Agency in the future, any new concepts would be subject to further evaluation and environmental review, as necessary.*

***Public Improvements***

*To transform the area into a livable residential neighborhood, the draft design for development document also includes improvements to the streetscape and open space for area residents and pedestrians. Four main types of public improvements are included: (1) neighborhood parks, (2) landmark plazas (3) pedestrian-oriented alleys, and (4) widened sidewalk zones.*

*The most prominent of the proposed public improvements is the addition of widened sidewalks to improve the pedestrian experience along all the streets in the area, providing connections to and from downtown, the waterfront, South Beach and Yerba Buena. The sidewalks along Beale, Main and Spear Streets are proposed to be widened to provide usable open space for the area's residents. In addition, it is proposed that the neighborhood be served with new parks programmed with various uses. Together these parks total 126,800 square feet. Two primary target zones for neighborhood parks are those zones where new residential development housing would be focused. Tower locations and heights have been carefully defined to minimize shading of parks and expanded streetscapes during the mid-day hours throughout the year. The primary opportunity and logical site for a landmark public plaza is on the north and south of the primary Transbay Terminal edifice, the east-west spine that will house the primary vehicular circulation for the terminal.*

*The proposed program includes new alleys as well as extensions to existing alleys throughout the Project Area, allowing for better pedestrian circulation throughout the neighborhood. Pedestrian alleys can have a high level of pedestrian activity, and can be improved with special paving, lighting, plantings, and furniture.*

*Critical improvements to the sidewalk environment appear necessary and are planned as a part of the redevelopment of the area. The widened sidewalks could serve two roles: (1) as improved linkages throughout the area but in particular to the terminal itself for the high volumes of pedestrian traffic that is expected as the area redevelops, and (2) as usable public open space on certain streets where adequate room exists to allow more active recreation uses.*

***Folsom Street** has been identified in the past as a location for a special pedestrian right-of-way that might act as the center of the new neighborhood and provide an active link to the waterfront along the Embarcadero. Portions of **Main, Beale, and Spear** Streets carry the lowest vehicular traffic volumes in the area, and there is excess capacity within the vehicular right-of-way for*

*projected traffic volumes. This makes it possible to use some of the street width for a pedestrian sidewalk zone.*

*Widening of sidewalks on these streets would be important given the significant number of housing units that would have access from or be adjacent to these streets, and could therefore enjoy the benefits of adjacent improved sidewalks. These streets are also the primary connectors from the eastern portion of the financial district to the South Beach waterfront area, where major open space amenities and public destinations are located, e.g., Pacific Bell Park.*

*Options are being explored for widening the sidewalk environment of other Transbay area streets. However, projected traffic volumes on many streets are such that only limited improvements would be possible – none of the scale and extent as those proposed for Folsom, Main, Beale and Spear Streets.*

## 2.3 ALTERNATIVES CONSIDERED AND WITHDRAWN

Various alternatives and design options for the different components of the proposed project were considered and subsequently withdrawn from further consideration based on their inability to satisfy the project purpose and need, operational constraints, potential environmental impacts, lack of cost-effectiveness, engineering feasibility, and other factors. These alternatives and the reasons they were withdrawn from further consideration are described below for the Transbay Terminal and the Caltrain Downtown Extension. Previous planning efforts for a Transbay Redevelopment Area Plan are discussed in Section 2.2.3.

### 2.3.1 TRANSBAY TERMINAL ALTERNATIVES CONSIDERED AND WITHDRAWN

As part of the study by the Metropolitan Transportation Commission (MTC), the Transbay Terminal Improvement Plan evaluated three alternative replacement terminal site configurations and a terminal renovation alternative based on the following criteria:

- Engineering issues
- Transit operations criteria
- Terminal operations criteria
- Terminal and transit operations cost analysis
- Joint development potential
- Urban design issues
- Overall project costs and revenues

The terminal replacement alternatives were named after Dickens novels and consisted of Our Mutual Friend, Great Expectations, and A Tale of Two Cities. The conceptualization and evaluation of these three terminal alternatives continued for 24 months. Alternatives were screened with input from the Transbay Terminal Plan Panel. Based on this screening, the

Transbay Terminal Plan Executive Committee (consisting of staff and policy board representatives from AC Transit, the City and County of San Francisco, the JPB, Caltrans, and MTC) selected the Transbay Terminal West Ramp Alternative ("Great Expectations") described above in Section 2.2.1.1. To assure that a full range of alternatives is evaluated, this EIS also includes the Loop Ramp Alternative described in Section 2.2.1.2, which is based on the MTC Study's "Our Mutual Friend" option.

### 2.3.1.1 Renovation of the Existing Transbay Terminal Building and Associated Structures

Renovating the existing Transbay Terminal building and its associated structures would produce a facility that would be most similar to the existing Transbay Terminal. It would be the least expensive of the terminal improvement alternatives that were considered within the Transbay Terminal Improvement Plan study. It offers no other benefits in comparison with the replacement alternatives, however.

Retaining the existing terminal building would not meet the project objectives. It would preclude most opportunities for improved space utilization, passenger circulation, signage, security, and safety. It would not accommodate the underground rail options – either a Caltrain extension or high-speed rail – and would require construction of new elevated rail structures. Although the existing Terminal, retrofitted to withstand a maximum credible earthquake, could accommodate a Caltrain Extension above-ground, such a strengthening would render the building impractical for multiple uses, including retail or commercial space. It therefore offers very limited potential for revenue-generating joint development within the terminal and would keep in place the elevated ramp structures that cross 10 city streets, which has contributed to the continued deterioration and underutilization of land in the Transbay Terminal area. For these reasons, and following review and concurrence by the Transbay Terminal Improvement Plan Panel and Executive Committee, the Renovation Alternative was withdrawn from further consideration.

### 2.3.1.2 New Bus Terminal at Main/Beale Site

In February 1999, the San Francisco Board of Supervisors passed a resolution repealing its prior endorsement of the Main/Beale site for a new terminal and urging the "City and County of San Francisco to work expeditiously with AC Transit, the Metropolitan Transportation Commission (MTC) and Caltrans to retain AC Transit regional bus service at the current Transbay Terminal site." AC Transit supported this action noting that the Main/Beale site would not provide the level of transit service that could be provided at the current terminal site and it would be farther from the employment locations of AC Transit's current riders. This site would not address project objectives to modernize the Transbay Terminal and improve its service. Withdrawal of the Main/Beal site was also consistent with the provisions of Proposition H, which calls for a multi-modal facility at the current Transbay Terminal site.

#### 2.3.1.3 A Tale of Two Cities Terminal at Transbay Terminal Site

The Tale of Two Cities terminal alternative was the most costly of the alternatives considered by the Transbay Terminal Improvement study. It offered substantial room for expansion of bus operations and would have accommodated the full 2020 bus program projected by terminal bus operators. It provided clear passenger circulation within the terminal structure and integrated retail and passenger circulation advantageously. Both AC Transit and rail services would have been vertically separated from Muni services by only one level, thus facilitating intermodal transfers.

The Tale of Two Cities terminal alternative did not meet the project objective to revitalize the Transbay Terminal area as well as the other terminal configurations. The extended footprint of this large facility did not contribute to improved utilization of land in the Transbay Terminal area and created long distances between modes for passengers circulating within the terminal. The facility also would have had elevated ramps crossing 10 city streets, which would have contributed to the continued "blight" in the area. The greatest negative with this alternative, however, was that the huge scale of the terminal facility and its integrated joint development led to costs almost twice these of the other two replacement alternatives. For these reasons, and following review and concurrence by the Transbay Terminal Improvement Plan Panel and Executive Committee, the Tale of Two Cities Alternative was withdrawn from further consideration.

### 2.3.2 Caltrain Downtown Extension Alternatives Considered and Withdrawn

Multiple Caltrain Downtown Extension alternatives and design options were considered and subsequently withdrawn from further consideration based on engineering feasibility, potential environmental impacts, operational constraints, or inability to meet the project purpose and need. These Caltrain Extension alternatives and the reasons they were withdrawn from further consideration are described in the following sections and are shown on Figure 2.3-1.

#### 2.3.2.1 Caltrain Downtown Extension Draft EIS/EIR (1997) Alignment

The Caltrain Extension alignment shown in the 1997 San Francisco Downtown Extension Project Draft EIS/EIR would follow Townsend Street and would curve north just east of Third Street and follow a tunnel alignment under Rincon Hill to Essex Street. It would be in a subway configuration under the alignment of the existing west bus ramps and follow the curve under the existing bus ramps into the basement of the new Transbay Terminal (see Figure 2.3-1, Alignment 1). It would not meet the project purpose to enable direct access to downtown San Francisco for future high-speed rail service. Its curve into the Transbay Terminal would have a 395-foot radius, which would not accommodate the high-speed steel-wheel-on-rail equipment currently in use in Europe and under consideration by the California High-Speed Rail Authority for implementation in California, including a station in downtown San Francisco.

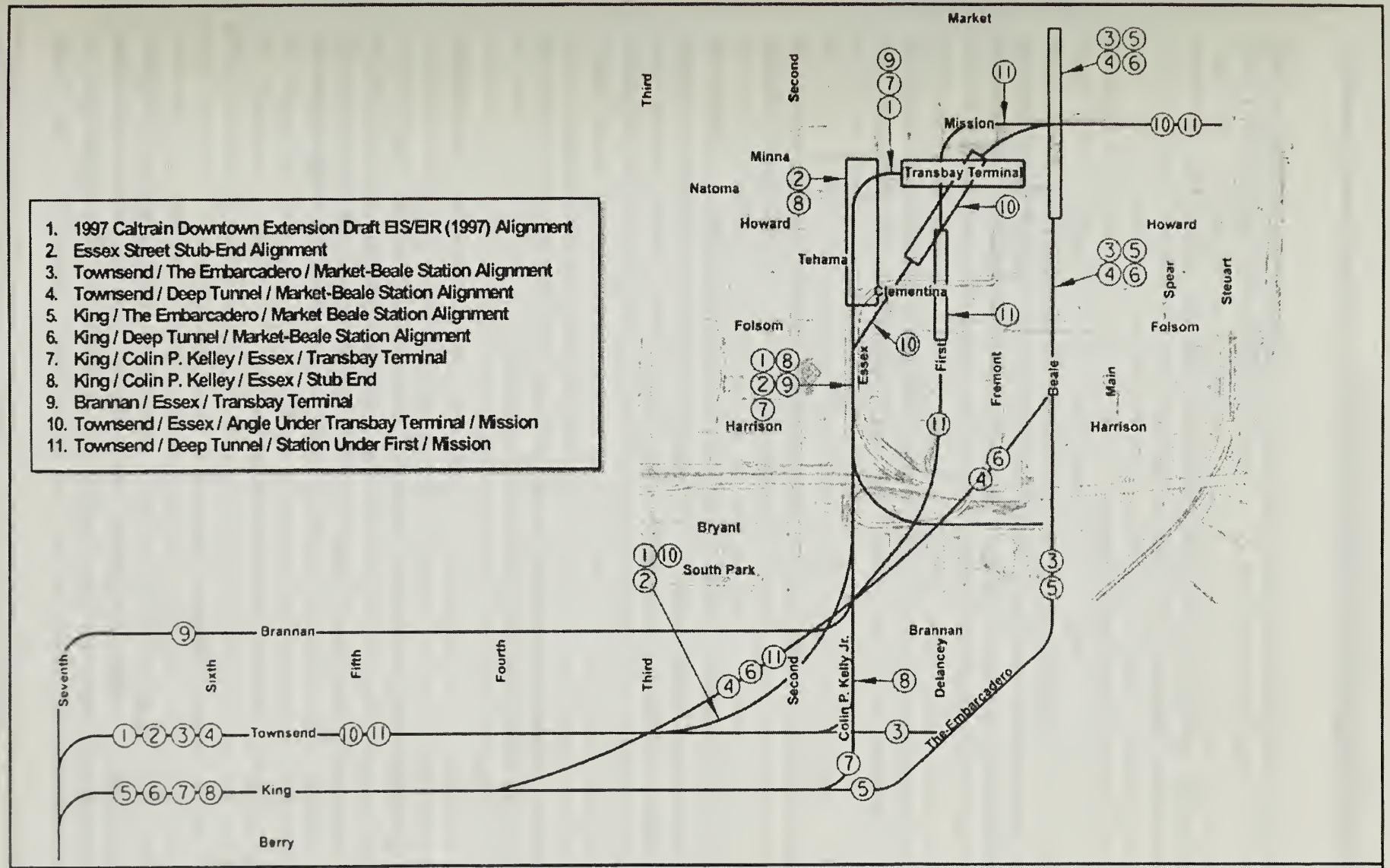



**Figure 2.3-1: Alternatives Considered and Withdrawn**

Given its inability to accommodate high-speed rail, this alignment was withdrawn from consideration. A critical project purpose is to provide a multi-modal transit facility that accommodates bus, paratransit, Greyhound, Caltrain, and high-speed rail service. As noted above, the curves for the Caltrain Extension Alternatives described in Section 2.2.2 would accommodate the existing European high-speed rail equipment

#### 2.3.2.2 Essex Street Stub-End Alignment

In response to the curve radii problems associated with the 1997 Caltrain Alignment, a new alignment was reviewed that would also tunnel under Rincon Hill and under the existing Transbay Terminal western ramps. Rather than curve into the basement of the Transbay Terminal, however, this alignment would include a train station that would be oriented perpendicular to and the west of the Transbay Terminal, with the northern end of this train station at Minna Street (see Figure 2.3-1, Alignment 2). This alignment would eliminate the tight curve leading into the Transbay Terminal and would enable the use of high-speed train equipment.

This alternative was included in the Notice of Preparation and Notice of Intent to Prepare this EIS/EIR, but has since been withdrawn from consideration. During the public scoping process, the public noted several problems associated with this alignment. These public comments and issues contributed to the withdrawal of this alignment. First, the train platforms would not be directly under the multimodal transit facility, so internal passenger circulation and the ease of transfer from one mode to another would be substantially compromised. Second, the orientation would not allow for trains to pass through the station. That is, the trains would not be able to enter one end and exit at the other end of the station to a storage track. For the stub-end station, trains would pull into the station and would need to reverse direction to leave the station. This would substantially reduce train operating efficiency and would not meet the project purpose to substantially improve Caltrain service to downtown San Francisco.

As described above, the two Caltrain Extension Alternatives under consideration in this EIS/EIR include tail tracks coming out of the east end of the train station. These trail tracks would allow for train storage and servicing, resulting in improved train operating efficiency. For example, trains would not need to be moved back to the Fourth and Townsend storage yard for storage and staging, but rather would be ready to be moved to a train platform from the tail track once a train vacated the platform; this train move would not block the train that is leaving the station. Finally, the tail tracks would allow for potential extension of commuter and high-speed rail service across the bay to Oakland, as a separate project.

#### 2.3.2.3 Other Caltrain Extension Alternatives Evaluated in 1997

As part of the 1997 Draft EIS/EIR analysis, five alignment options applying different construction techniques for different segments were considered for an alternative to extend Caltrain to an underground station at Market and Beale Streets or at the Transbay Terminal. A detailed description of these alternatives and their characteristics is provided in the Design

Options Screening Report, Caltrain San Francisco Downtown Extension Project, Peninsula Corridor Joint Powers Board, 1995.

Under the first option, the Caltrain Extension would have diverted from the existing Caltrain tracks at about Seventh and Berry Streets, travel subsurface along the south side of Townsend Street, curve beneath the southbound lanes of The Embarcadero roadway, and then travel northward along and under Beale Street to a proposed underground station at Market Street (see Figure 2.3-1, Alignment 3). Cut-and-cover and soft-ground tunneling techniques were investigated to evaluate engineering feasibility and minimize disruptions at the surface. Both a short-tunnel option with a portal between Fifth and Sixth Streets and a long-tunnel option with a portal at Seventh Street were considered. Differing alignment options for the final segment entering an underground train station at Market and Beale Streets were also considered.

The second alignment option would have followed the same route along Seventh and Townsend, using subway and/or cut-and-cover construction techniques. From this point, the alignment would have descended, curving northeasterly, in a mined tunnel under Rincon Hill. Under Beale Street, the tunnel would ascend and continue, using cut-and-cover techniques, to the proposed underground train station, with alignment variations according to the different train station configurations (see Figure 2.3-1, Alignment 4).

A third alignment would follow the King Street right-of-way rather than Townsend Street for the eastward segment. It would travel east on King to The Embarcadero, and continue northeastward in cut-and-cover tunnel subsurface along The Embarcadero right-of-way to Beale Street. It would then travel northward to an underground train station at Market and Beale (see Figure 2.3-1, Alignment 4).

A fourth alignment would follow the King Street right-of-way in cut-and-cover tunnel, curve northeasterly east of Fourth Street, transition to a mined tunnel at approximately Third and King Streets, and then continue to an underground train station at Market and Beale (see Figure 2.3-1, Alignment 5).

The fifth option would follow along King Street for the westernmost segment from about Seventh and Berry Streets to the Embarcadero (see Figure 2.3-1, Alignments 7 and 8). This alignment would be capable of being combined with the remaining portions of any of the Transbay Terminal or Market and Beale Streets terminal alignments described above.

The alignments along Beale Street leading from The Embarcadero would pass near the Bay Bridge anchorage, raising issues regarding the effects of cut-and-cover construction on this major structure. The alignments using cut-and-cover construction down King or Townsend Street and The Embarcadero would introduce potentially substantial noise, traffic, air quality and other environmental impacts during construction within the South Beach neighborhood and elsewhere along The Embarcadero. This is an area that has experienced prolonged disruption from prior construction of The Embarcadero roadway and Muni Metro Extension projects. The

King Street Alignment would also introduce traffic and other environmental impacts for the new baseball park at King and Second Streets.

Extending the line north of Mission Street all the way to Market Street would have been costly, given that at least two train levels would have been needed, resulting in a deep excavation between older, historic buildings, and given the existence of subsurface structures (e.g., subsurface parking) in this part of the Beale Street right-of-way. Similarly, expanding the proposed Caltrain terminal to six tracks to accommodate future high-speed rail would cost more at the Market/ Beale Street location than at the Transbay Terminal. Finally, these alternatives would again introduce a stub-end station, reducing train operating efficiency (as described above in Section 2.3.2.2) and would not meet the project purpose to substantially improve Caltrain service to downtown San Francisco.

Because of the additional capital and operating costs and the reduced operating efficiencies for this alternative compared to the alternatives defined herein and the major issues at the proposed train station site, the Caltrain Extension Alternative to the Market and Beale Street Terminal was withdrawn from further consideration.

The King Street alignment segment was withdrawn from consideration because it would have caused severe traffic disruptions during construction, e.g., baseball games at Pacific Bell Park. Moreover, construction of this alignment would have meant tearing up the newly constructed southbound lanes of King Street and would have been complicated by a large box sewer line located adjacent to this alignment.

The Caltrain terminal at Market and Beale Streets was ultimately withdrawn from further consideration because of the narrow right-of-way available on Beale Street, requiring construction of a multi-level train station between two historic structures.

#### 2.3.2.4 Alignment along Brannan Street for the Westernmost Segment of the Caltrain Extension

This alignment would follow Brannan Street rather than Townsend Street or King Street for the first segment of the Caltrain Extension from about Seventh and Berry Streets to The Embarcadero (see Figure 2.3-1, Alignment 9). The Brannan Street alignment portion was capable of being combined with the remaining portions of any of the Transbay Terminal or Market and Beale Streets terminal alignments. It was withdrawn from further consideration because the alignment would have passed on the surface in front of the Sixth Street off-ramp for I-280 and would have traveled along the densely developed Brannan Street adversely affecting traffic operations.

#### 2.3.2.5 Alignment From Essex Street Passing at an Angle Under the Transbay Terminal Site at First Street

This alignment would follow the Essex Street tunnel alignment with a cut-and-cover section north of Folsom Street passing at an angle under the center (near First Street) of the new Transbay Terminal (see Figure 2.3-1, Alignment 10). It was withdrawn from further consideration because of the impacts that this long tunnel would have on real estate above the alignment, including the need for substantial property acquisitions, including both existing development and development currently under construction between Folsom and Mission Streets on both sides of First Street.

#### 2.3.2.6 Alignment Tunneling under Rincon Hill to a Tunnel and Terminal Station Directly Under the First Street Right-of-Way

This alignment would generally follow the Essex Street tunnel alignment under Rincon Hill, but the tunnel would angle more to the east to meet the First Street right-of-way (see Figure 2.3-1, Alignment 11). A two-or three-level train station would then be constructed under the First Street right-of-way south of a new Transbay Terminal. This multi-level train terminal would require a transition of the train tracks from a one-level to a "stacked" configuration, which would need to occur to the south of the train terminal station. There is insufficient length to make such a transition under the Townsend Street right-of-way, and it is not advisable, from a tunnel construction safety or tunneling cost perspective, to build such a transition in the tunnel portion under Rincon Hill. This alternative was therefore withdrawn from further consideration.

### 2.3.3 Caltrain Storage Yard Located in Brisbane

An alternative to the Fourth and Townsend location proposed for a Caltrain midday storage and layover yard was a site at the former Bayshore Yard in Brisbane. This potential yard site was withdrawn from further consideration because of its distance from the proposed new Caltrain terminal. "Deadhead" time (the amount of time the train would be operated out of revenue service) would have been at least three and one-half times greater than the time to the current Caltrain facility, adding substantially to Caltrain operating costs and adversely affecting the ability to operate efficient and safe train service at anticipated levels of service.

# CHAPTER 3: TRANSPORTATION ANALYSIS

This chapter describes existing and projected future transportation conditions in the project area. It includes the following four sections: 1) transit, 2) vehicular traffic, 3) non-motorized traffic, and 4) parking. The transit section describes current and future rail and bus services and patronage. The vehicular traffic section describes the existing and future street and highway system in the corridor. The non-motorized traffic section focuses on existing pedestrian/bicycle traffic patterns, and future pedestrian walkways, bike paths, and attractors. The parking section describes existing parking amounts, locations, accessibility, and future needs.

The information provides a baseline to assess the level of impact to existing transit services for each of the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project (Terminal/Extension Project) alternatives. Existing rail transit and bus service in and around the Terminal/Extension Project study area and planned future rail and bus service are described. See Figure 3-1 for a map illustrating the transit network in the study area.

## 3.1 TRANSIT

### 3.1.1 EXISTING RAIL TRANSIT SERVICES

Caltrain, BART, and Muni Metro provide rail service in the study area. Service consists of commuter rail, heavy rail, light rail transit, and historic streetcar trolleys. BART and Muni Metro serve the Market Street subway located along the north edge of the study area. Caltrain provides passenger rail service from the south bay to the San Francisco terminal at Fourth and Townsend Streets. Figure 3-1 shows the rail transit network in the study area.

#### 3.1.1.1 Caltrain

Caltrain provides commuter rail service between Santa Clara County and San Francisco. The Peninsula Corridor Joint Powers Board (JPB), a joint powers agency consisting of San Francisco, San Mateo, and Santa Clara counties, operates the service. The 77-mile rail line serves 34 stations. The San Francisco terminal at Fourth and Townsend Streets is approximately 1.3 miles from the Transbay Terminal at Mission and First Streets. *During* off-peak hours, the main southern terminal is the Tamien Station in San Jose, which provides a connection with the Santa Clara County light rail system. Of the *76* one-way weekday train trips on Caltrain, five morning trips originate and five evening trips terminate at the Gilroy Station. *Weekend service has been suspended two years until March 2004 for construction of passing tracks and other upgrades of the signaling system, trackwork, and other improvements to allow for "Baby Bullet" express service.* Figure 3.1-1 shows the Caltrain corridor and stations.

Fig3-1_ReTransitNetwork

| Figure 3-1 | Transit Network in the Project Area |
|---|---|

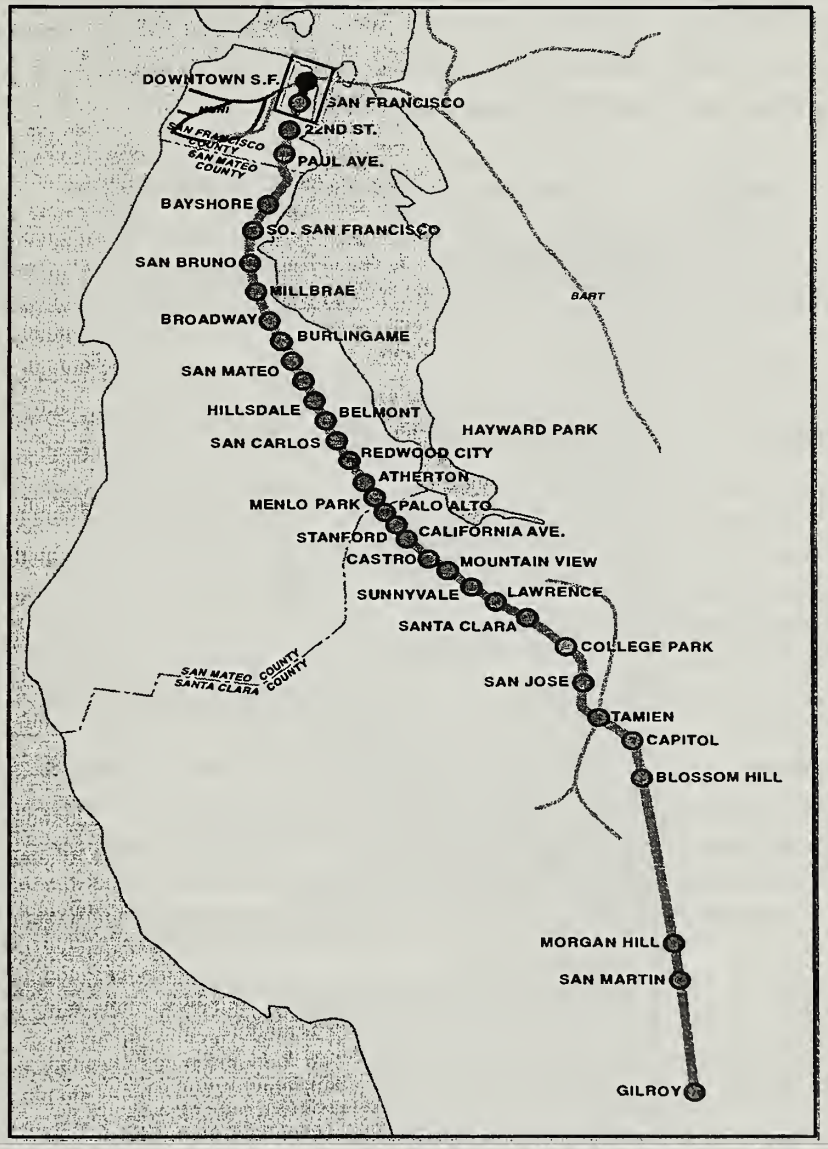



**Figure 3.1-1: Caltrain Corridor with Stations**

At the Fourth and Townsend Station, Caltrain connects with the Muni N-Judah light rail and nine Muni bus lines. The station is also served by an Amtrak bus connection to the Amtrak rail station in Emeryville. Connections with SamTrans are not provided at Fourth and Townsend but are available at 11 South Bay train stations (or within one block of these stations). Connections with Santa Clara Valley Transportation Authority (VTA) bus lines are available at 15 South Bay Caltrain stations. Currently there is no direct connection between Caltrain and BART. Table 3.1-1 summarizes Muni, SamTrans, and VTA connecting bus services at Caltrain Stations. Table 3.1-2 details Muni service at the Fourth and Townsend Station.

**Table 3.1-1: Connecting Bus Service at Caltrain Stations**

| Caltrain | Feeder Bus Service |
|---|---|
| Fourth & Townsend | Muni 10, 15, 30, 38L, 45, 47, 80x, 81x, 82x, N-Judah Light Rail |
| 22nd Street | Muni 48 |
| Paul Avenue | Muni 29 |
| Bayshore | Muni 9, 9X, 15, 56; SamTrans 292 |
| South San Francisco | SamTrans 130, 131, 32, 34, 292 |
| San Bruno | SamTrans 40, 41 |
| Millbrae | SamTrans MX, 242, 390, 391 |
| Broadway | SamTrans 292; Burlingame Free Bee |
| Burlingame | SamTrans 292; Burlingame Free Bee |
| San Mateo | SamTrans TX, 250, 292, 295 |
| Hayward Park | Shelter only; no ticket sales |
| Bay Meadows | Race days only |
| Hillsdale | SamTrans KX, TX, 250, 262, 390, 391, 292, 294, 295 |
| Belmont | SamTrans KX, PX, TX, 260, 262, 390 |
| San Carlos | SamTrans KX, PX, TX, 261, 390 |
| Redwood City | SamTrans KX, PX, RX, 270, 271, 390, 391 |
| Atherton | Shelter only; no ticket sales |
| Menlo Park | SamTrans KX, RX, 390, 295, 296 |
| Palo Alto | SamTrans KX, PX, RX, 280, 281, 282, 390, 391; SCVTA 22, 35, 86, 300 |
| Stanford | Football days only |
| California Avenue | SCVTA 24, 88, Marguerite Shuttle |
| San Antonio | SCVTA 32, 35, 50, 86 |
| Mountain View | SCVTA 20, 50, 51, 52, 145, 304, 304A |
| Sunnyvale | SCVTA 32, 53, 54, 55, 56, 140, 26 (Weekends) |
| Lawrence | SCVTA 41, 43, 145, 304A |
| Santa Clara | SCVTA 10, 22, 32, 34, 44, 60, 300, 304A |
| College Park | SCVTA 36, 62 |
| San Jose | SCVTA 11, 22, 63, 64, 65, 68, 180, 300, 304A, Hwy. 17 |
| Tamien | SCVTA 25, 67, 82, Light Rail |
| Capitol | SCVTA 66, 68, 304, 304-A |
| Blossom Hill | SCVTA 67 |
| Morgan Hill | SCVTA 14, 15, 521 |
| San Martin | SCVTA 18, 18A, 19, 68, 521 |
| Gilroy | SCVTA 18, 18A, 19, 68, 521 |

**Source:** Muni, SamTrans, Santa Clara Valley Transportation Authority, Nelson/Nygaard, 2002.

**Table 3.1-2: Muni Service at the Fourth and Townsend Caltrain Station**

| Bus Line | Typical Weekday Hours of Operation | Typical Headways in Minutes | | | | | Average Weekday Route Passengers | Estimated Weekday Boardings and Alightings at the Caltrain Station |
|---|---|---|---|---|---|---|---|---|
| | | Weekday | | | Sat. | Sun. | | |
| | | Peak | Base | Eve. | Base | Base | | |
| 10-Townsend | 5:30 AM - 1:20 AM | 10 | 12 | 15 | 12 | 12 | N/A | N/A |
| 15-Third Street | 4:45 AM - 1:30 AM | 5-10 | 10 | 15 | 10 | 10 | 27,735 | 1,623 |
| 30-Stockton | 5:00 AM - 2:00 AM | 4-5 | 5-10 | 8-10 | 6 | 5-10 | 26,428 | 3,071 |
| 45-Union/Stockton | 5:30 AM - 2:00 AM | 6-9 | 6 | 15-17 | 12 | 15 | 19,344 | 2,252 |
| 47- Van Ness | 6:00 AM - 1:15 AM | 6-7 | 7-8 | 12-15 | 7-8 | 7-8 | N/A | N/A |
| 76 - Marin Headlands | Daytime Sundays Only | - | - | - | 60 | 60 | N/A | N/A |
| 80x- Caltrain Express | 7:00 AM - 9:30 AM; 3:30 PM - 6:15 PM | 6-10 | - | - | - | - | 526 | 756 |
| 81x- Caltrain Express | 6:15 AM - 9:30 AM; 3:35 PM - 6:00 PM | 5-30 | - | - | - | - | 718 | 843 |
| 82x- Presidio & Wharves Express | 6:15 AM -9:15 AM; 3:30 PM - 6:40 PM | 20-30 | - | - | - | - | 711 | 477 |
| N-Judah Light Rail | 5:00 AM - 1:45 AM | 8 | 10 | 12 | 10 | 12 | 39,051 | 3,455 |

**Notes:** Service on the 10-Townsend and 47-Van Ness Lines began on June 9, 2000. Estimated boardings and alightings on the N-Judah refer only to the peak period (6 AM -9 AM and 3:30 PM to 7:00 PM) rather than a full day of service.

**Sources:** Muni published schedules, February 2001; Muni Monitoring Data, FY 99 - 00

Weekday Caltrain service is a combination of express and local service. Weekday service hours are from 4:30 a.m. to midnight. Saturday service operates from 6:00 a.m. to midnight. Sunday service operates from 7:30 a.m. to 10:30 p.m. Frequencies during the weekday peak period vary between five and 30 minutes. During the midday, trains run every 30 minutes. During evenings, trains run every 60 minutes. On weekends, trains run every 60 to 120 minutes.

Caltrain's fares are based upon travel zones that were adjusted July 1, 1998. The system is divided into nine fare zones. One-way adult fares vary from $1.25 for travel within one zone to $6.25 for traveling the entire length of the 77-mile corridor. Disabled patrons and seniors ride for approximately half the regular one-way adult fare. Children under five ride free when accompanied by a fare-paying adult. Children between five and 11 years ride for approximately half the adult fare. A monthly ticket is available for unlimited rides between a specified number of zones. On weekends and holidays, the monthly ticket is valid for travel between all zones served by Caltrain. A Caltrain monthly ticket valid for two or more zones is good as local fare credit on all SamTrans and VTA buses. Discount monthly tickets are available to persons 17 years old and younger with a valid ID, seniors, disabled patrons or high school students older than 17. One-way weekday discount tickets are 25 percent off the regular fare and valid only on weekday trains that are scheduled to start their runs at San Jose or San Francisco stations between the morning and afternoon peaks. Ten-ride tickets and weekend passes are also available for purchase.

Weekday Caltrain ridership in February 2001 *was* estimated at 35,609 passengers; *current ridership is lower because of the recession. Of the February 2001 ridership,* almost 20 percent of the daily passengers *boarded* at the San Francisco Fourth and Townsend Station. During the morning peak, 27 percent of the passengers exit at the San Francisco terminus. During the afternoon peak, 39 percent of the passengers exit at Caltrain stops in San Mateo County and 44 percent exit at stops in Santa Clara County.[1] Table 3.1-3 shows the weekday boardings and alightings at Caltrain stations.

### 3.1.1.2 BART

BART provides heavy rail passenger service in the metropolitan Bay Area. The grade-separated service operates at high speeds of up to 80 miles per hour. BART currently has five operating lines: Pittsburg/Bay Point–Colma, Fremont–Daly City, Richmond–Daly City/Colma, Fremont-Richmond, and Dublin/Pleasanton–Daly City. All lines except the Fremont–Richmond line serve downtown San Francisco via a subway directly beneath Market Street.

BART shares four stations in downtown San Francisco with Muni Metro: Embarcadero, Montgomery, Powell and Civic Center. BART passengers can also make connections to the Muni bus lines serving Market Street. Although there is not a direct transfer connection between BART and Caltrain, Muni's N-Judah light rail connects the Embarcadero Station with Caltrain's Fourth and Townsend terminus.

BART's service hours are approximately 4:00 a.m. to midnight, Monday through Friday; 6:00 a.m. to midnight on Saturday; and 8:00 a.m. to midnight on Sunday. BART operates direct service between Pittsburg/Bay Point and Colma, Fremont and Richmond, as well as Dublin/Pleasanton and Daly City seven days a week during all service hours. At night and all day Sunday, only these three routes operate, requiring passengers to transfer if their destination is on a line that is not in service. Transfer stations are at the 12$^{th}$ Street / Oakland City Center Station, the MacArthur Station, and the Bay Fair Station. The West Oakland Station is also used as an "unofficial transfer station." Table 3.1-4 summarizes the frequency of BART trains.

BART's fare structure is built on a distance-based formula. The fare for most one-way trips wholly within San Francisco is $1.10. An additional $0.05 is charged for travel from the downtown Market Street subway stations to the Balboa Park Station. An additional $0.60 is charged for travel from the Daly City and Colma stations. One-way fares from downtown San Francisco to the East Bay range from $2.05 to $4.10. The maximum one-way fare is $4.70, from Colma to the Pittsburg/Bay Point Station.

BART has several discount passes. The blue high-value tickets with fare values of $35 and $48 are sold at a 6.25 percent discount. BART red tickets offer a 75 percent discount for disabled persons and children aged five to 12. BART green tickets offer a 75 percent discount for seniors. BART orange tickets provide a 50 percent discount for middle or secondary school students. The BART Plus ticket works in the BART fare gates like a regular BART ticket but also offers an unlimited number of local bus rides within the valid half-monthly time period.

[1] Caltrain Ridership Survey, February 2001

**Table 3.1-3: Caltrain Rail Service in the Study Area**

| Station | Typical Headway in Minutes [1] | | | | | Weekday Boardings and Alightings |
|---|---|---|---|---|---|---|
| | Weekday | | | Sat. | Sun. | |
| | Peak 5-30 | Base 30 | Eve. 4-25 | Base 60 | Base 120 | |
| **San Francisco County** | | | | | | |
| Fourth & Townsend | | | | | | 13,609 |
| 22nd Street | | | | | | 1,334 |
| Paul Avenue | | | | | | 49 |
| Bayshore | | | | | | 1,021 |
| **San Mateo County** | | | | | | |
| South San Francisco | | | | | | 1,360 |
| San Bruno | | | | | | 1,728 |
| Millbrae | | | | | | 1,801 |
| Broadway | | | | | | 1,117 |
| Burlingame | | | | | | 1,811 |
| San Mateo | | | | | | 2,754 |
| Hayward Park | | | | | | 1,205 |
| Bay Meadows | | | | | | 156 |
| Hillsdale | | | | | | 2,664 |
| Belmont | | | | | | 1,741 |
| San Carlos | | | | | | 2,453 |
| Redwood City | | | | | | 3,607 |
| Atherton | | | | | | 574 |
| Menlo Park | | | | | | 2,623 |
| **Santa Clara County** | | | | | | |
| Palo Alto | | | | | | 4,542 |
| California Avenue | | | | | | 2,766 |
| San Antonio | | | | | | 1,625 |
| Mountain View | | | | | | 4,410 |
| Sunnyvale | | | | | | 2,842 |
| Lawrence | | | | | | 2,610 |
| Santa Clara | | | | | | 2,248 |
| College Park | | | | | | 437 |
| San Jose | | | | | | 3,590 |
| Tamien | | | | | | 1,612 |
| Capitol | | | | | | 229 |
| Blossom Hill | | | | | | 348 |
| Morgan Hill | | | | | | 793 |
| San Martin | | | | | | 435 |
| Gilroy | | | | | | 1,102 |
| **Caltrain Total Daily Boardings & Alightings** | | | | | | **71,214** |

**Sources:** Caltrain published schedule, April 29, 2001. Caltrain Ridership Statistics, February 2001.

Recent BART ridership counts from April 2001 show an average weekday ridership of 333,800 passengers. Most passenger activity occurs in downtown San Francisco at the Embarcadero, Montgomery, Powell, and Civic Center stations (see Table 3.1-4). Weekday boardings at these stations are about 115,055 passengers or about 34 percent of the total weekday boardings. Approximately 50 percent of the daily trips are transbay. Montgomery Station has the highest number of entries and exits with an average weekday activity of 71,466 passengers entering and exiting the station.[2] Table 3.1-4 also shows the percentage of entries at each BART station that are transbay trips.

**Table 3.1-4: BART Transbay Service and Ridership**

| Line/Stations | Weekday Hours of Operation | Typical Headways in Minutes | | | | | Weekday Boardings & Alightings | Weekday Transbay Passengers (by Station Origin) | Percent of Station Entries that are Transbay Trips |
|---|---|---|---|---|---|---|---|---|---|
| | | Weekday | | | Sat. | Sun. | | | |
| | | Peak | Base | Eve. | Base | Base | | | |
| **Pittsburg/ Bay Point - Colma** | 4:00 AM - 1:00 AM | 5 | 15 | 20 | 20 | 20 | | | |
| Pittsburg/Bay Point | | | | | | | 9,644 | 2,615 | 56% |
| North Concord | | | | | | | 4,175 | 1,395 | 65% |
| Concord | | | | | | | 12,409 | 3,240 | 51% |
| Pleasant Hill | | | | | | | 13,825 | 4,769 | 68% |
| Walnut Creek | | | | | | | 11,972 | 3,512 | 61% |
| Lafayette | | | | | | | 6,112 | 2,024 | 69% |
| Orinda | | | | | | | 5,168 | 1,767 | 71% |
| Rockridge | | | | | | | 9,402 | 3,221 | 71% |
| **Fremont-Daly City** | 5:00 AM - 7:40 PM | 15 | 15 | - | 20 | - | | | |
| Fremont (2) | | | | | | | 12,463 | 2,794 | 45% |
| Union City (2) | | | | | | | 8,144 | 1,801 | 45% |
| South Hayward (2) | | | | | | | 6,281 | 1,364 | 43% |
| Hayward (2) | | | | | | | 9,858 | 1,724 | 36% |
| Bay Fair (2) (3) | | | | | | | 10,362 | 2,478 | 47% |
| San Leandro (2) (3) | | | | | | | 10,049 | 2,521 | 50% |
| Coliseum (2) (3) | | | | | | | 13,721 | 2,733 | 39% |
| Fruitvale (2) (3) | | | | | | | 16,704 | 3,747 | 44% |
| Lake Merritt (2) (3) | | | | | | | 9,154 | 2,340 | 52% |
| **Richmond – Daly City/Colma** | 5:00 AM - 7:40 PM | 15 | 15 | - | 20 | - | | | |
| Richmond (2) | | | | | | | 8,626 | 1,769 | 40% |
| El Cerrito del Norte (2) | | | | | | | 16,792 | 4,134 | 52% |
| El Cerrito Plaza (2) | | | | | | | 7,820 | 2,057 | 52% |
| North Berkeley (2) | | | | | | | 7,331 | 2,169 | 60% |
| Downtown Berkeley (2) | | | | | | | 21,216 | 3,858 | 36% |
| Ashby (2) | | | | | | | 8,618 | 2,334 | 54% |

[2] BART Ridership Statistics, April 2001

**Table 3.1-4: BART Transbay Service and Ridership**

| Line/Stations | Weekday Hours of Operation | Typical Headways in Minutes | | | | | Weekday Boardings & Alightings | Weekday Transbay Passengers (by Station Origin) | Percent of Station Entries that are Transbay Trips |
|---|---|---|---|---|---|---|---|---|---|
| | | Weekday | | | Sat. | Sun. | | | |
| | | Peak | Base | Eve. | Base | Base | | | |
| **Fremont-Richmond** | 4:00 AM - 1:00 AM | 15 | 15 | 20 | 20 | 20 | See stations marked (2) | | |
| **Dublin/Pleasanton – Daly City** | 4:00 AM - 1:00 AM | 15 | 15 | 20 | 20 | 20 | | | |
| Pleasanton | | | | | | | 12,815 | 4,245 | 67% |
| Castro Valley | | | | | | | 4,230 | 1,385 | 65% |
| **Stations Common to Most Lines** | | | | | | | | | |
| MacArthur (1) (2) | | | | | | | 13,274 | 3,425 | 49% |
| 19th Street (1) (2) | | | | | | | 16,641 | 3,558 | 43% |
| 12th Street (1) (2) | | | | | | | 24,816 | 5,045 | 41% |
| West Oakland | | | | | | | 10,148 | 4,252 | 82% |
| Embarcadero | | | | | | | 69,433 | 24,544 | 72% |
| Montgomery | | | | | | | 71,466 | 22,783 | 66% |
| Powell | | | | | | | 53,099 | 13,920 | 52% |
| Civic Center | | | | | | | 37,541 | 11,020 | 58% |
| 16th Street | | | | | | | 19,697 | 2,637 | 26% |
| 24th Street | | | | | | | 24,748 | 2,570 | 20% |
| Glen Park | | | | | | | 15,303 | 1,328 | 17% |
| Balboa Park | | | | | | | 24,796 | 1,291 | 10% |
| Daly City | | | | | | | 16,306 | 2,125 | 26% |
| Colma (1) | | | | | | | 14,058 | 1,345 | 19% |
| **Total** | | | | | | | **668,217** | **165,839** | **50%** |

**Notes:**
(1) Common to Richmond and Pittsburg/Bay Point Lines only
(2) Stations on the Fremont - Richmond Line
(3) Stations on the Pleasanton Line

**Sources:** BART published schedules, May 2001; Bart Statistics, April 2001.

### 3.1.1.3 Muni Metro

The San Francisco Municipal Railway (Muni) operates the Muni Metro light rail system. For the most part, the system operates in mixed traffic except for the subway sections through central San Francisco and small sections of exclusive at-grade right of way. Muni currently has seven operating lines: J-Church, K-Ingleside, L-Taraval, M-Ocean View, S-Castro, N-Judah, and the F-Market.

All of the lines except the F-Market serve the downtown San Francisco subway stations. The J, K, and M lines also connect with BART at the Balboa Park Station. The J Line also serves the Glen Park Station. Muni's Metro service connects with Caltrain via the N-Judah light rail line, which continues from the Embarcadero Station along a surface extension to the Fourth and Townsend Caltrain Station. The F-Market line consists of historic streetcars running partially in

a transit priority lane along the surface of Market Street. Service is provided between Fisherman's Wharf and the Castro Street neighborhood.

Muni Metro lines generally operate between 5:00 a.m. and 1:00 a.m. weekdays, 6:00 a.m. and 1:00 a.m. Saturdays; and 8:00 a.m. and 1:00 a.m. Sundays. Metro Owl service, late-night surface bus service, is offered for portions of various lines. Weekday headways vary between five and 12 minutes depending on the line and time of day. Table 3.1-5 shows the frequencies and ridership of Muni light rail. In 1999, the N-Judah had the highest ridership with 39,000 average weekday boardings.

**Table 3.1-5: Muni Rail Services in the Study Area**

| Line | Typical Weekday Hours of Operation | Typical Headway in Minutes | | | | | Average Weekday Route Ridership |
|---|---|---|---|---|---|---|---|
| | | Weekday | | | Sat. | Sun. | |
| | | Peak | Base | Eve. | Base | Base | |
| F- Market | 5:00 AM – 2:00 AM | 5-8 | 7-8 | 15 | 8 | 8 | 9,353 |
| S- Castro | Peak AM & PM only | 7-12 | - | - | - | - | N/A |
| J- Church | 4:00 AM – 2:00 AM | 7-10 | 10 | 12 | 12-18 | 12-20 | 13,680 |
| K- Ingleside | 5:00 AM – 1:00 AM | 9 | 10 | 15-20 | 12 | 15 | 18,087 |
| L- Taraval | 5:00 AM – 1:30 AM | 5-10 | 10 | 14-20 | 10 | 12 | 28,209 |
| M- Ocean View | 4:30 AM – 1:30 AM | 9 -12 | 10 | 10-15 | 12 | 15 | 28,088 |
| N- Judah | 5:00 AM – 1:45 AM | 8 | 10 | 12 | 10 | 12 | 39,051 |

**Note:** The S-Castro began service on April 2, 2001.

**Sources:** Published Muni Schedules, February 2001; Muni monitoring data, FY 99 - FY 00.

### 3.1.2 Existing Bus Services

Muni, SamTrans, AC Transit and Golden Gate Transit provide bus service in the study area. All four operators offer service either within or in the vicinity of the area's major transit hub, the Transbay Terminal at Mission and First Streets. The terminal is also served by paratransit services, Greyhound interregional buses, Gray Line tour buses, and other private tour operations. Caltrain's Fourth and Townsend Station is served by Muni and limited Amtrak bus service only. The ferry terminal at Mission and Embarcadero is served by Golden Gate Transit's ferry feeder bus service. Muni is in the process of abandoning use of the Ferry Terminal's off-street bus turnaround at Mission and Stuart Streets and moving the terminals for 11 Muni lines to the Ferry Terminal's surrounding streets. Caltrain stations in the South Bay have connecting bus service provided by Muni, SamTrans, and the VTA. Table 3.1-1 summarizes the bus connections at the 34 Caltrain stations.

#### 3.1.2.1 Muni Bus Service

Muni currently operates 83 transit lines in regular weekday service. Fifty-six of these are motor coach (diesel bus) and 17 are trolley coach (electric bus). The other 10 lines include seven light rail and three cable car lines. Most bus lines operate seven days a week, between 6:00 a.m. and midnight. Limited late night (owl) service is available between 1:00 a.m. and 5:00 a.m. on

sections of 13 Muni routes. On weekdays, service frequencies, or headways, generally range from four to 12 minutes during peak periods, five to 20 minutes during midday, and 10 to 30 minutes during evenings. On weekends, base frequencies generally range from five to 60 minutes, depending on demand and headway policy. In February 2001, Muni began implementing the South of Market Action Plan, a series of service changes that included the partition of the 42-Downtown Loop into the 47-Van Ness and the 10-Townsend, expanded service and frequencies on the 12-Folsom, and extension of the 19-Polk to Townsend Street.

The basic Muni fare for a one-way trip is $1.25. Cash fares include a free transfer given at the time of boarding. *Adult* monthly passes *at $45.00* are available for travel on all Muni lines as well as BART, SamTrans, and Caltrain service within San Francisco. Seniors, disabled persons, and children under 18 are charged $0.35 for one-way trips and *$10.00* for monthly passes. Also available are weekly passes for *$12.00* and weekly tourist passes for $33.75, which includes admission to several city visitor attractions.

Muni operates 10 bus lines that directly serve either the Transbay Terminal or its immediate vicinity: the 5-Fulton, 6-Parnassus, 10-Townsend, 14-Mission, 14L-Mission Limited, 14x-Mission Express, 38-Geary, 38L-Geary Limited, 76-Marin Headlands, and the 108-Treasure Island. Five of these routes, including the 5, 6, 38, 38L, and 108, terminate at the terminal. Table 3.1-6 summarizes the service characteristics of the Muni lines that serve the Transbay Terminal, including operating hours, frequencies, number of boardings, and the passenger activity at the Transbay Terminal. Figure 3.1-2 shows the Muni lines within the study area that serve the Transbay Terminal.

**Table 3.1-6: Muni Service at the Transbay Terminal**

| Bus Line | Typical Weekday Hours of Operation | Typical Headways in Minutes | | | | | Average Weekday Route Passengers | Estimated Weekday Boardings and Alightings |
|---|---|---|---|---|---|---|---|---|
| | | Weekday | | | Sat. | Sun. | | |
| | | Peak | Base | Eve. | Base | Base | | |
| 5-Fulton | 24 Hours | 4-9 | 5-12 | 15 | 6-10 | 9 | 15,458 | 1,221 |
| 6-Parnassus | 5:20 AM - 2:10 AM | 7-10 | 12 | 20 | 12 | 20 | 6,434 | 405 |
| 10-Townsend | 5:30 AM - 1:20 AM | 10 | 12 | 15 | 12 | 12 | N/A | N/A |
| 14-Mission | 24 Hours | 5-10 | 6 | 10 | 7-8 | 7-8 | 37,310 | 1,778 |
| 14L-Mission Limited | 8:15 AM - 4:45 PM | 20 | 20 | - | 15 | 15 | 6,052 | 496 |
| 14x-Mission Express | 6:30 AM - 9:00 AM; 4:00 PM - 6:45 PM | 8-9 | - | - | - | - | 2,572 | 658 |
| 38-Geary | 24 Hours | 7-8 | 7-8 | | 14 | 15 | 28,779 | 1,598 |
| 38L-Geary limited | 6:00 AM - 6:30 PM | 7-8 | 7-8 | - | 7 | - | 18,127 | 1,469 |
| 76-Marin Headlands | Daytime Sundays Only | - | - | - | 60 | 60 | N/A | N/A |
| 108-MUNI Treasure Island | 4:20 AM -1:00 AM | 20 | 20-60 | 20 | 45 | 45 | 517 | 529 |

**Notes:** Service on the 10-Townsend line began on June 9, 2000. Estimated boardings and alightings on the N-Judah refer only to the peak periods (6 AM - 9 AM and 3:30 PM to 7:00 PM) rather than a full day of service.

**Sources:** Muni published schedules, February 2001; Muni Monitoring Data, FY 99 – 00.

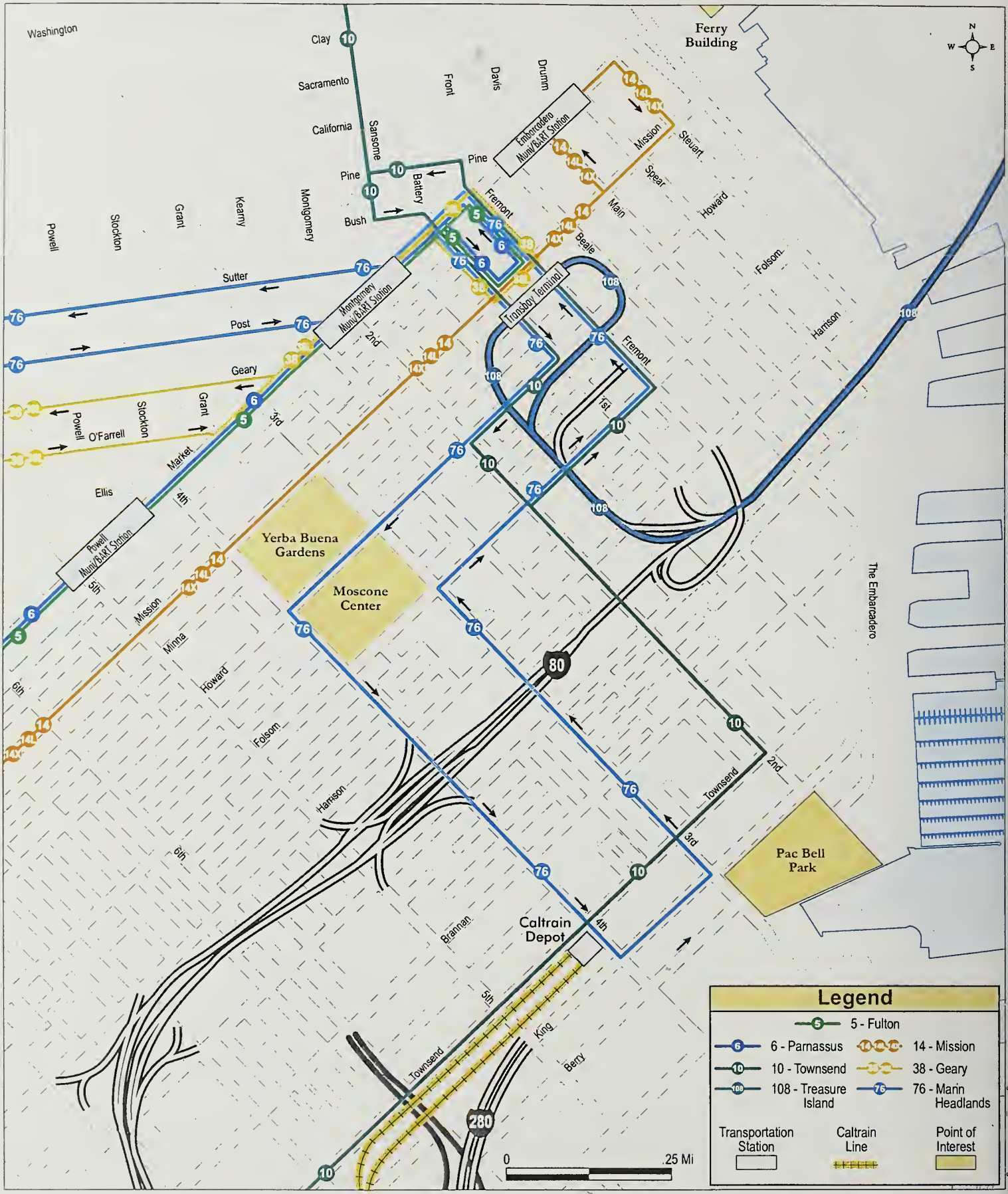



Figure 3.1-2 | Muni Service at the Transbay Terminal

Within the study area, Muni operates 29 routes that do not serve the Transbay Terminal. Their service characteristics are summarized in Table 3.1-7. The routes are mapped in Figure 3.1-3.

**Table 3.1-7: Non-Transbay Terminal Muni Service in the Study Area**

| Bus Line | Typical Weekday Hours of Operation | Typical Headways in Minutes | | | | | Estimated Weekday Route Passengers |
|---|---|---|---|---|---|---|---|
| | | Weekday | | | Sat. | Sun. | |
| | | Peak | Base | Eve. | Base | Base | |
| 1- California | 4:40AM – 2:30AM | 6-9 | 5-10 | 10-17 | 6-8 | 6-8 | 28,793 |
| 1-AX California Express | 6:45AM – 9:00AM<br>4:15PM – 6:30PM | 10,15 | - | - | - | - | - |
| 1-BX California Express | 6:45AM – 9:15AM<br>4:15PM – 6:30PM | 5-7, 10 | - | - | - | - | - |
| 2- Clement | 5:00AM – 8:00PM | 10 | 20 | - | 15 | 15 | 6,865 |
| 3- Jackson | 6:30AM – 1:30AM | 10 | 20 | 20 | 15 | 15 | |
| 4- Sutter | 5:00AM – 7:30PM | 10 | 20 | - | - | - | |
| 6- Parnassus | 5:20AM – 2:10AM | 7-10 | 12 | 20 | 12 | 20 | 6,434 |
| 7- Haight | 5:30AM – 7:30PM | 10 | 12 | - | 12 | 20 | 5,620 |
| 9- San Bruno | 5:00AM – 1:40PM | 6-9 | 10 | 15 | 10 | 10 | 18,461 |
| 9x- San Bruno Express | 7:00AM – 7:30PM | 7-12 | 12 | - | - | - | 8,416 |
| 12-Folsom | 5:30 AM – 1:30AM | 7-10 | 10 | 20 | 10 | 10 | 3,829 |
| 15- Third | 4:45AM – 1:30AM | 5-10 | 10 | 15 | 10 | 10 | 27,735 |
| 21- Hayes | 5:15AM – 1:45AM | 5-8 | 6-10 | 20 | 12 | 12 | 9,740 |
| 30- Stockton | 5:00AM – 2:00AM | 4-5 | 5-10 | 8-10 | 6 | 5-10 | 26,428 |
| 30x- Marina Express | 6:00AM – 9:45AM<br>3:45PM – 7:00PM | 5-7 | - | - | - | - | 2,467 |
| 31- Balboa | 4:45AM – 2:00AM | 10 | 10-12 | 15 | 15 | 15 | 10,149 |
| 31AX- Balboa Express | 6:45AM – 8:45AM<br>4:15PM – 6:30PM | 8-9,10 | - | - | - | - | |
| 31BX- Balboa Express | 6:45AM – 9:00AM<br>4:15PM – 6:30PM | 10 | - | - | - | - | |
| 38AX- Geary Express | 7:00AM – 9:00AM<br>4:00PM – 7:30PM | 10,15 | - | - | - | - | |
| 38BX- Geary Express | 6:45AM – 9:00AM<br>4:15PM – 7:30PM | 7-9, 10-12 | - | - | - | - | |
| 41- Union | 5:00AM – 9:30AM<br>3:30PM – 7:45PM | 10 | - | - | - | - | 3,560 |
| 45- Union/Stockton | 5:30AM – 2:00AM | 6-9 | 6 | 15-17 | 12 | 15 | 19,344 |
| 66- Quintara | 5:45AM – 12:00AM | 20 | 20 | 30 | 30 | 30 | 1,188 |
| 71- Haight - Noriega | 5:45AM – 1:15AM | 10 | 12 | 15-20 | 12 | 10 | 10,195 |
| 80x- Gateway Express | 7:00AM – 9:30AM<br>3:30PM – 6:15PM | 6-10 | - | - | - | - | 526 |
| 81x- Caltrain Express | 6:15AM – 9:30AM<br>3:35PM – 6:00PM | 5-30 | - | - | - | - | 718 |
| 82x- Levi Express | 6:15AM – 9:15AM<br>3:30PM – 6:40PM | 20-30 | - | - | - | - | 711 |
| 91- Owl | 12:15AM – 6:15AM | 30 | - | - | - | - | 365 |

**Sources:** Muni Published Schedules, February 2001; Muni Monitoring Data, FY 99-00.

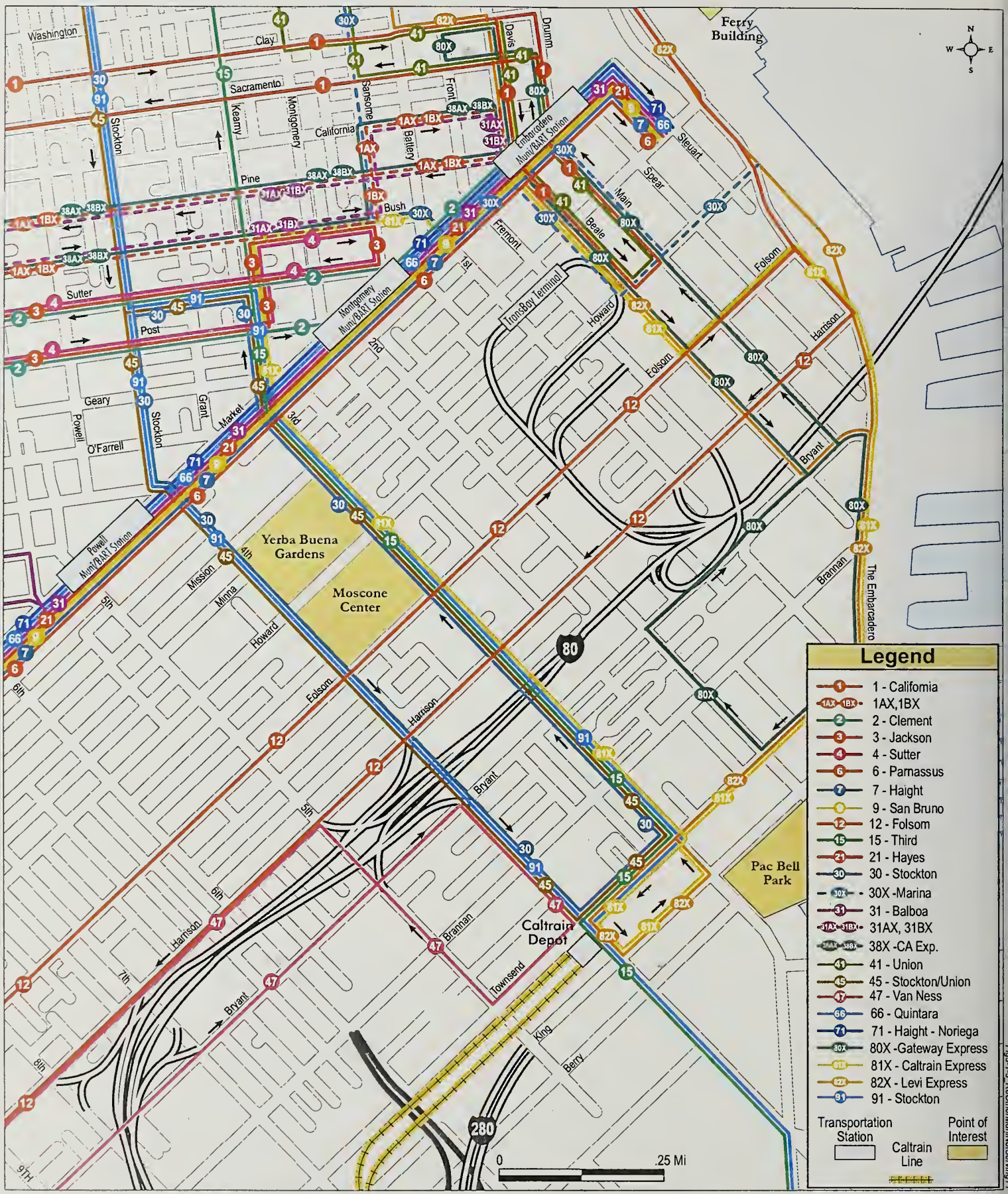



Figure 3.1-3 | Non-Transbay Terminal Muni Service in the Study Area

Muni operates nine bus lines that serve the Fourth and Townsend Caltrain Station: the 10-Townsend, 15-Third, 30-Stockton, 38L-Geary Limited, 47-Van Ness, 45-Union/Stockton, 80x-Caltrain Express, 81x-Caltrain Express, 82x-Presidio & Wharves Express. The N-Judah light rail line also serves the station. Figure 3.1-4 shows the routes of Muni lines within the study area that serve the Caltrain Station. Table 3.1-8 summarizes their service characteristics.

**Table 3.1-8: Muni Service at the Fourth and Townsend Caltrain Station**

| Bus Line | Typical Weekday Hours of Operation | Typical Headways in Minutes | | | | | Average Weekday Route Passengers | Estimated Weekday Boardings and Alightings |
|---|---|---|---|---|---|---|---|---|
| | | Weekday | | | Sat. | Sun. | | |
| | | Peak | Base | Eve. | Base | Base | | |
| 10-Townsend | 5:30 AM – 1:20 AM | 10 | 12 | 15 | 12 | 12 | N/A | N/A |
| 15-Third Street | 4:45 AM – 1:30 AM | 5-10 | 10 | 15 | 10 | 10 | 27,735 | 1,623 |
| 30-Stockton | 5:00 AM – 2:00 AM | 4-5 | 5-10 | 8-10 | 6 | 5-10 | 26,428 | 3,071 |
| 45-Union/Stockton | 5:30 AM – 2:00 AM | 6-9 | 6 | 15-17 | 12 | 15 | 19,344 | 2,252 |
| 47- Van Ness | | 6-7 | 7-8 | 12-15 | 7-8 | 7-8 | N/A | N/A |
| 76 - Marin Headlands | Daytime Sundays Only | - | - | - | 60 | 60 | N/A | N/A |
| 80x- Caltrain Express | 7:00 AM – 9:30 AM; 3:30 PM – 6:15 PM | 6-10 | - | - | - | - | 526 | 756 |
| 81x- Caltrain Express | 6:15 AM – 9:30 AM; 3:35 PM – 6:00 PM | 5-30 | - | - | - | - | 718 | 843 |
| 82x- Presidio & Wharves Express | 6:15 AM –9:15 AM; 3:30 PM – 6:40 PM | 20-30 | - | - | - | - | 711 | 477 |
| N-Judah Light Rail | 5:00 AM – 1:45 AM | 8 | 10 | 12 | 10 | 12 | 39,051 | 3,455 |

**Notes:** Service on the 10-Townsend and 47-Van Ness lines began on June 9, 2000; estimated boardings and alightings on the N-Judah refer only to the peak periods (6 AM -9 AM and 3:30 PM to 7:00 PM) rather than a full day of service.

**Sources:** Muni published schedules, February 2001; Muni Monitoring Data, FY 99-00.

### 3.1.2.2 AC Transit

AC Transit provides local, express, and commuter service in western Alameda County and western Contra Costa County. Of AC Transit's 138 routes, 35 offer transbay service between the East Bay and the Transbay Terminal, the operator's only San Francisco stop. Midday storage of AC Transit occurs on the Transbay Terminal bus ramps, which can provide storage for up to 120 standard 40-foot buses.

Of the 35 transbay routes, five are 'basic service' that operate seven days a week throughout the day and 31 are 'commuter service' that operate peak periods only. On weekdays, headways for peak period service vary between seven and 30 minutes. Most commute trips are offered in the peak direction only with westbound service provided in the morning and eastbound service in the evening. Figure 3-1 shows the route that AC Transit buses take to serve the Transbay Terminal. Table 3.1-9 summarizes the service characteristics of the basic and commuter services.

Approximately 15,205 daily weekday passengers use AC Transit's transbay service. The line with the highest ridership is the O-Alameda with 1,780 daily boardings.[3]

[3] AC Transit Passenger Counts, February 2001.

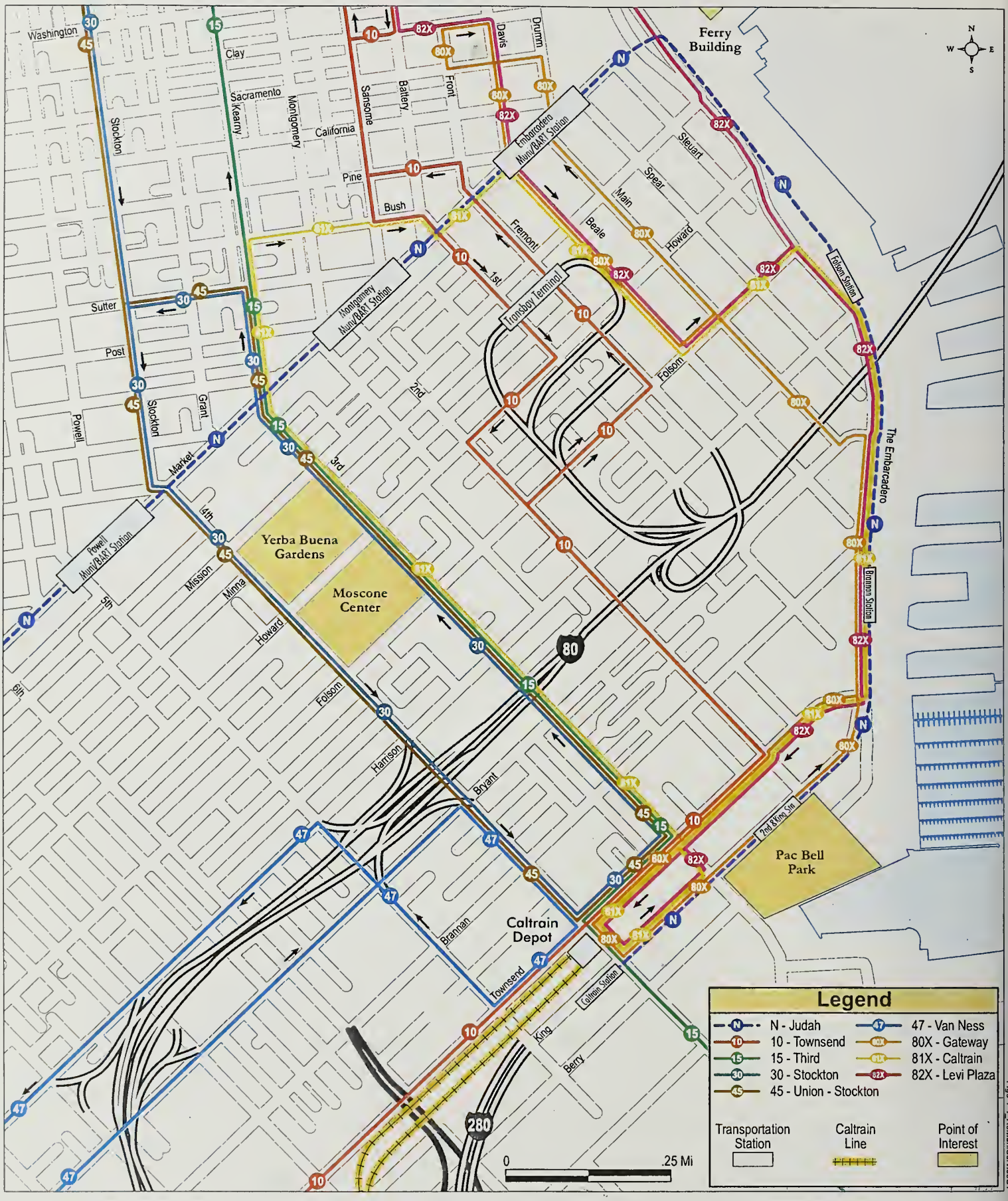



Figure 3.1-4 | Muni Service at the Caltrain Station

**Table 3.1-9: AC Transit Service at the Transbay Terminal**

| Bus Line | Typical Weekday Hours of Operation | Typical Headway in Minutes | | | | | Weekday Transbay Ridership |
|---|---|---|---|---|---|---|---|
| | | Weekday | | | Sat. | Sun. | |
| | | Peak | Base | Eve. | Base | Base | |
| **Basic Transbay Service** | | | | | | | |
| F - Berkeley | 4:45 AM - 12:45 AM | 15 - 30 | 30 | 30 | 30 | 30 | 817 |
| N - San Leandro | 4:40 AM - 9:07 AM; 7:10 PM - 12:52 AM | 30 | - | 10-30 | 30 | 30 | 711 |
| NL - San Leandro | 6:10 AM - 8:07 PM | 20-30 | 30 | 30 | 30 | 30 | 991 |
| O - Alameda | 5:27 AM - 12:41 PM | 7-20 | 45 | 60 | 60 | 60 | 1778 |
| A - Oakland Airport | 24 Hours | 30 | 30 | 30 | 30 | 30 | 314 |
| **Commute Hour Only Transbay Service** | | | **AM Peak Trips** | | **PM Peak Trips** | | |
| | | | Westbound | Eastbound | Westbound | Eastbound | |
| B - Trestle Glen | | | 4 | 0 | 5 | 0 | 157 |
| BX - Trestle Glen | | | 4 | 0 | 2 | 3 | 55 |
| C - Piedmont | | | 10 | 4 | 10 | 14 | 461 |
| CB - Montclair | | | 4 | 0 | 0 | 4 | 191 |
| E - Claremont | | | 8 | 0 | 0 | 10 | 321 |
| FS – Berkeley | | | 5 | 0 | 0 | 5 | 236 |
| G - El Cerrito | | | 10 | 0 | 0 | 9 | 518 |
| H/HX - El Cerrito | | | 10 | 0 | 0 | 10 | 526 |
| K - San Leandro | | | 5 | 0 | 0 | 6 | 185 |
| KH - San Leandro | | | 5 | 0 | 0 | 5 | 131 |
| L - El Sobrante | | | 9 | 0 | 0 | 12 | 476 |
| LA - El Sobrante | | | 13 | 8 | 7 | 13 | 760 |
| LB - El Sobrante | | | 7 | 0 | 7 | 13 | 425 |
| LC - El Sobrante | | | 7 | 0 | 0 | 10 | 445 |
| LD (LX) - Richmond | | | 5 | 2 | 0 | 5 | 255 |
| NF - San Leandro | | | 6 | 0 | 0 | 11 | 445 |
| NG - San Leandro | | | 5 | 0 | 0 | 11 | 525 |
| NH - San Leandro | | | 6 | 1 | 1 | 11 | 359 |
| NV - San Leandro | | | 2 | 0 | 0 | 4 | 103 |
| OX/OX1 -0 Alameda | | | 11 | 0 | 0 | 14 | 813 |
| P (CH) - Piedmont | | | 7 | 0 | 0 | 16 | 712 |
| RCV/RCVX - Castro Valley | | | 7 | 0 | 0 | 7 | 231 |
| S - Hayward | | | 5 | 0 | 0 | 4 | 226 |
| SA (SW) - Hayward | | | 4 | 0 | 0 | 6 | 244 |
| SB - Newark | | | 5 | 0 | 0 | 6 | 285 |
| V - Montclair | | | 7 | 0 | 0 | 17 | 703 |
| W (W1) - Alameda | | | 9 | 0 | 0 | 10 | 504 |
| WA (W2) - Alameda | | | 3 | 0 | 0 | 3 | 104 |
| Y - Emeryville | | | 2 | 0 | 0 | 2 | 56 |
| Z - Albany | | | 0 | 8 | 7 | 0 | 142 |
| **Total** | | | | | | | **15,205** |

**Sources:** AC Transit published schedules, March 2001; AC Transit passenger counts, February 2001.

Most AC Transit Transbay trips cost $2.50 for a one-way ticket, $22.00 for a 10-ride ticket book and $80.00 for a monthly pass. Longer distance transbay trips are priced at $2.75 for a one-way ticket, $25.00 for a 10-ride ticket book and $90.00 monthly pass. Service between the Transbay Terminal and Oakland airport costs $5.00. Seniors, disabled persons, and children under 12 are eligible for 50 percent discounts on all types of tickets except the monthly passes.

### 3.1.2.3 SamTrans

SamTrans provides connections to the Daly City and Colma BART stations, the San Francisco International Airport, and downtown San Francisco. In August 1999, SamTrans reorganized its local and commuter service into a core system with reallocated service from areas of little demand to areas of greater demand. Table 3.1-10 summarizes the SamTrans service between the Transbay Terminal and communities along the Peninsula. Nine lines provide commute service between San Mateo County and the Transbay Terminal. Seven of these lines operate only during peak periods. Figure 3.1-5 shows SamTrans routes that serve the Transbay Terminal.

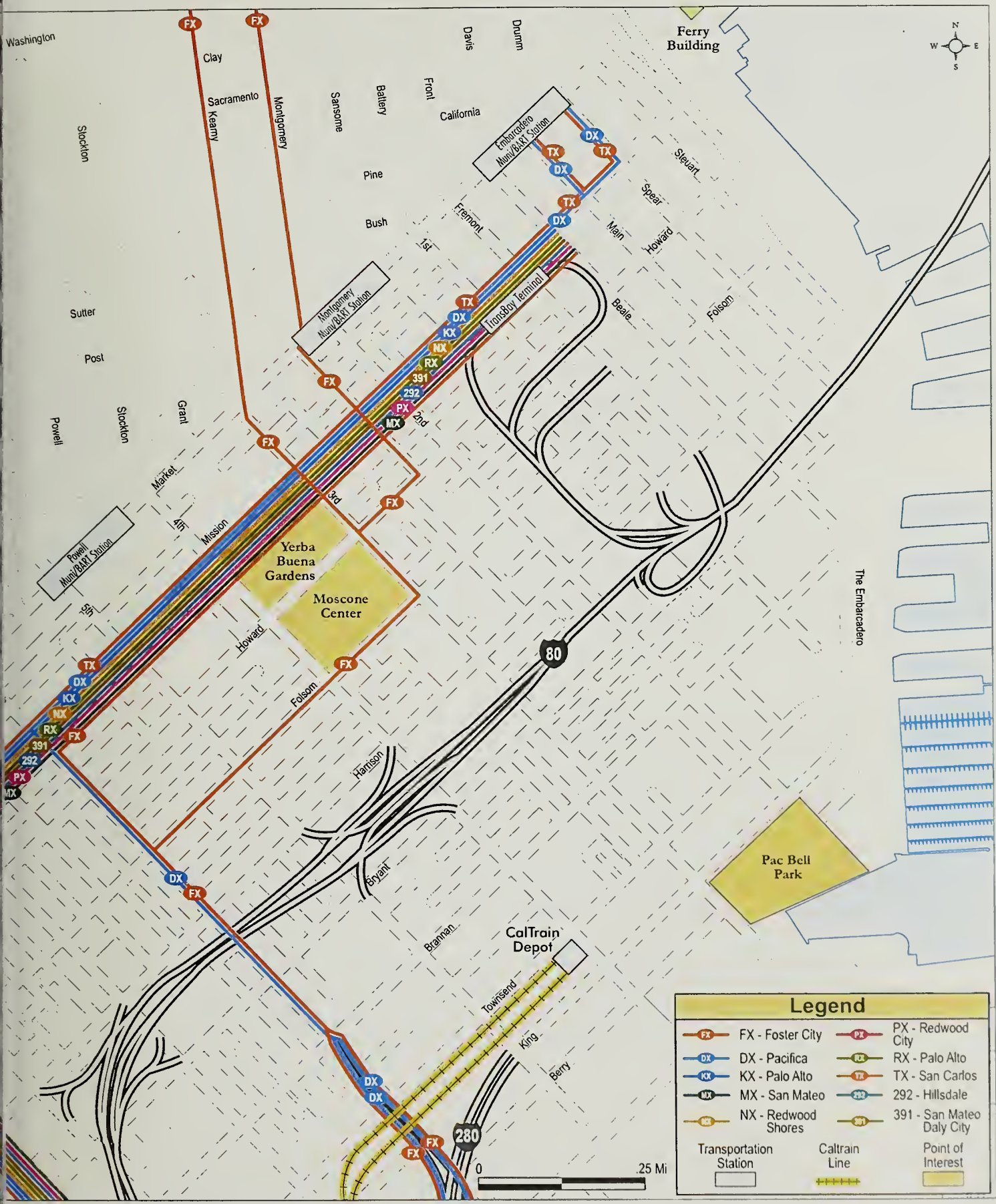
**Table 3.1-10: SamTrans Bus Service in the Transbay Terminal Area**

| Bus Line | Typical Weekday Hours of Operation | Typical Headway in Minutes | | | | | Weekly Afternoon Peak Period Ridership out of San Francisco |
|---|---|---|---|---|---|---|---|
| | | Weekday | | | Sat. | Sun. | |
| | | Peak | Base | Eve. | Base | Base | |
| DX Pacifica-San Francisco | AM & PM Peak Only | 10-15 | | | | | 172 |
| KX Palo Alto-San Francisco | 5:15 AM - 1:45 AM | 25-40 | 25-40 | 60 | 30 | 30 | 296 |
| MX San Mateo - San Francisco | AM & PM Peak Only | 20-30 | | | | | 88 |
| NX Redwood Shores-San Francisco | AM & PM Peak Only | 30 | | | | | 48 |
| PX Redwood City-San Francisco | AM & PM Peak Only | 10-30 | | | | | 72 |
| RX Palo Alto-San Francisco | AM & PM Peak Only | 15-40 | | | | | 32 |
| TX San Carlos-San Francisco | AM & PM Peak Only | 20 | | | | | 64 |
| 391 San Mateo-Daly City-San Francisco | AM & PM Peak Only | 20 | - | | | | 432 |
| 292 San Francisco - Hillsdale S.C. | 4:45 AM - 2:15 AM | 20-40 | 25-35 | 60 | 30 | 30 | 464 |

Note: Ridership figures refer to the number of southbound SamTrans passengers leaving San Francisco during the afternoon peak period of 4 PM - 7PM. SamTrans does not currently have data available describing the daily patronage specifically at the Transbay Terminal.

One-way cash fares for travel between San Francisco and the South Bay are $2.20 for regular intercity service and $3.00 for express service. Seniors and disabled persons pay $0.50 for regular service and $1.25 for express service during non-peak periods. Youth, between six and 17, pay $1.50 for regular service and $1.25 for express service.

Tokens are sold in packages of 10 at a 10 percent savings over cash fares. Monthly passes cost $56.00 for regular service and $102.00 for express service. Seniors and disabled persons are charged $18.00 for regular service passes. Children under 17 pay $22.00 for regular service passes. SamTrans passengers may also purchase a Muni sticker, which upgrades their monthly passes to include unlimited rides on Muni. Stickers cost $17.00 when purchased with a regular service pass and $11.00 with an express pass.




igure 3.1-5 | Sam Trans Routes Serving the Project Area

### 3.1.2.4 Golden Gate Transit

Operated by the Golden Gate Bridge, Highway, and Transportation District, Golden Gate Transit provides daily bus service to Marin and Sonoma counties with connections to San Francisco and the El Cerrito Del Norte BART Station in Contra Costa County. Within San Francisco, the major transfer and boarding points are the San Francisco Transbay Terminal, Seventh and Market Streets near the Civic Center, and the Golden Gate Bridge Toll Plaza. Golden Gate Ferry provides daily ferry service between Larkspur or Sausalito in Marin County and San Francisco. Midday storage for Golden Gate Transit buses occurs at an off-site location at Main and Howard Streets. The storage area supports 125 buses.

*Golden Gate Transit offers 29 transbay routes between Marin County and the Transbay Terminal. Seven of these routes form Golden Gate Transit's Basic Service which generally operates every day and nearly 24 hours per day. Route 10 operates only on weekends in San Francisco; Routes 30 and 90 operate only on weekdays.* Most of Golden Gate Transit's basis service lines are routed along Mission and Van Ness Streets to serve the Civic Center.

The other 21 transbay routes provide commuter service only during weekday peak periods. Frequencies during peak periods for both basic and commuter routes vary between five and 60 minutes. Most of the commuter service routes travel along Battery and Sansome Streets to serve the Financial District. Frequencies during peak periods for both basic and commuter routes vary between five and 60 minutes. Figure 3.1-6 shows Golden Gate Transit routes that serve the Transbay Terminal area and Table 3.1-11 summarizes Golden Gate's service in the Terminal area.

The Golden Gate service area is divided into ten fare zones. Transbay adult cash fares for one-way bus travel range from $2.*65* to $5.*65*. Ferry service between San Francisco and Larkspur costs $3.*25* on weekdays and $*5.60* on weekends or holidays. Ferry service between San Francisco and Sausalito costs $5.60 regardless of the day of travel. Seniors and disabled persons are eligible for a 50 percent discount on bus and ferry tickets. Children receive a 25 percent discount. Inter-county passes containing 20 tickets are discounted 20 percent from face value. Two Golden Gate Transit routes, Line 67 and Line 69, offer free shuttle service between the Ferry Terminal and San Francisco's financial district, South of Market area, and the Civic Center. Most GGT buses and all Golden Gate ferries are equipped to transport bicycles.

Current ridership data are not available for Golden Gate Transit. In March 1997, Golden Gate estimated the number of southbound passengers as 3,684 during the morning peak (7:30 a.m. - 8:30 a.m.) and 18 during the evening peak (4:30 p.m. - 5:30 p.m.). Northbound passengers were estimated at 375 during the morning peak and 3,207 during the evening peak.

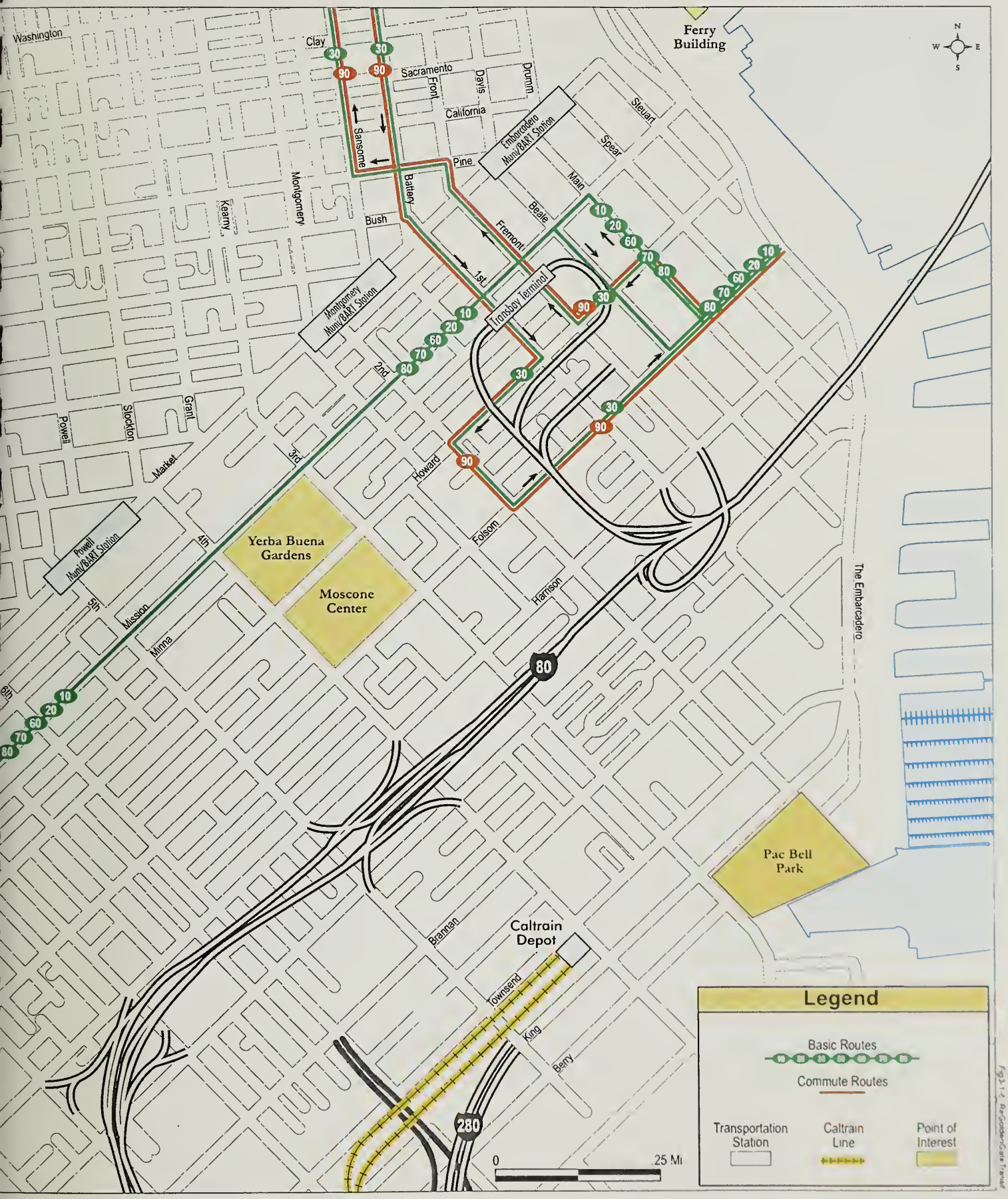



Figure 3.1-6 | Golden Gate Transit Service at the Transbay Terminal

**Table 3.1-11: Golden Gate Transit Service at the Transbay Terminal Area**

| Bus Routes | Typical Weekday Hours of Operation | Typical Headways in Minutes | | | | |
|---|---|---|---|---|---|---|
| | | Weekday | | | Sat. | Sun. |
| | | Peak | Base | Eve. | Base | Base |
| **Basic Routes** | | | | | | |
| 10 Tiburon-Mill Valley-Sausalito (1) | Weekends Only | - | - | - | 60 | 60 |
| 20 Canal-San Anselmo-Corte Madera | 4:30 AM - 2:00 AM | 30 | 30 | 60 | - | - |
| 30 San Rafael-Larkspur Ferry | 8:15 AM - 5:00 AM | 60 | 60 | 60 | - | - |
| 50 San Marin-Novato-San Rafael-Sausalito | 4:00 AM - 1:00 AM | 30 | 30 | 60 | 60 | 60 |
| 60 San Rafael | (2) | (2) | (2) | (2) | (2) | (2) |
| 70 Novato-San Rafael | (2) | (2) | (2) | (2) | (2) | (2) |
| 80 Santa Rosa-Novato-San Rafael | 24 Hours | 20 - 30 | 30 | 30 - 60 | 30 | 30 |
| **Commute Routes (Operate Peak Times Only)** | | | | | | |
| 2 Marin Headlands-Marin City | | 10-20 | | | | |
| 4 Mill Valley | | 7-10 | | | | |
| 8 Tiburon | | 15 - 30 | | | | |
| 18 San Anselmo-College Of Marin-Corte Madera | | 30 - 60 | | | | |
| 24 Lagunitas-Manor-San Anselmo-Greenbrae | | 5-10 | | | | |
| 26 Sleepy Hollow-San Rafael | | 15-20 | | | | |
| 28 San Rafael-Canal-Larkspur Landing | | 30 | | | | |
| 32 Peacock Gap-San Rafael | | 30 -60 | | | | |
| 34 Santa Venetia-San Rafael | | 30 - 45 | | | | |
| 38 Terra Linda | | 10-15 | | | | |
| 44 Lucas Valley | | 15-30 | | | | |
| 48 Novato-Ignacio | | 30 | | | | |
| 54 San Marin-Novato Blvd. | | 5-15 | | | | |
| 56 San Marin | | 10-15 | | | | |
| 72 Santa Rosa-Rohnert Park Expressway | | *14-55* | | | | |
| 74 Santa Rosa-Petaluma | | 15-30 | | | | |
| 76 Rohnert Park-East Petaluma | | 30 | | | | |
| 78 Santa Rosa-Sebastopol | | 25-50 | | | | |
| 90 Sonoma Valley-San Rafael | | (3) | | | | |
| 93 Golden Gate Bridge-S.F. Civic Center | | 10-15 | | | | |

Notes:
(1) Transbay Service on weekends Only.
(2) Routes 60 and 70 are part of Route 80 Service. Hours of operational weekdays are combined for 60, 70, and 80 service from San Francisco.
(3) Only *two* southbound and one northbound run serve the Transbay Terminal area.
Source: Golden Gate Transit published schedules, June 2001.

### 3.1.3 OTHER SERVICES

#### 3.1.3.1 Caltrans Bay Bridge Bicycle Shuttle

Caltrans operates the Bay Bridge Bike Shuttle, which runs during peak commute periods when bikes may not be carried across the Bay on BART. Service is provided between the Transbay Terminal in San Francisco, Treasure Island, and the MacArthur BART station. Four westbound and three eastbound shuttles are provided during both morning and evening peak periods. The service costs $1.00.

#### 3.1.3.2 *Special Commuter Services*

There are *two special commuter services* serving the study area including the Napa Valley Commute Club and the Valley of the Moon Commute Club. The Napa Valley Commute Club is a non-profit organization that offers commuters peak direction morning and evening service between Napa Valley and San Francisco. The morning service boards passengers at three locations in the City of Napa and drops them off at 15 stops in San Francisco including Fremont Street between Mission and Howard Streets. Evening service boards passengers at the Transbay Terminal's street level crescent loading area on Mission Street. Approximately 50 passengers ride the service's single coach bus during both morning and evening service. Membership is $170 per calendar month. For infrequent riders, the cost is $8.00 one-way or $13.00 round-trip.[4] *As of March 2001, the Napa Valley Commute Club operates one southbound and one northbound trip during the peak period.*

Valley of the Moon Commute Club is a member run club, which carries North Bay commuters between Sonoma Valley and San Francisco. In San Francisco, stops are made along Mission Street at First, Jessie, Fourth, and Sixth Streets. Monthly subscriptions are $135. *As of October 2002, the Valley of the Moon Commute Club operates two southbound and two northbound trips during the peak periods.*

#### 3.1.3.3 Greyhound

Greyhound Lines is an interregional, private bus operation carrying passengers and package freight. At the Transbay Terminal, there are 43 daily outbound schedules during the off-peak season and 49 daily schedules during the peak season (June through August). Greyhound does not serve the Caltrain Fourth and Townsend Station. The most popular destinations are Sacramento, Reno, Los Angeles, San Jose, and Santa Cruz. During weekends and holidays, Greyhound adds additional service. In May 2001, six roundtrip runs of commuter service were added between the Transbay Terminal and Sacramento. In 2000, Greyhound counted a total of 263,040 outbound passengers at the Transbay Terminal.

[4] Interview with Napa Valley Commute Club Representative, Bob Streich, June 4, 2001

### 3.1.3.4 Amtrak

Amtrak does not offer rail service in San Francisco but offers connecting bus service between downtown San Francisco and Amtrak's Emeryville Station. Within the study area, bus stops are located at the Caltrain Fourth and Townsend Station, the Moscone Center on Howard Street at Fourth, the Hyatt Regency on Market and Davis, and the Ferry Building.

The thruway bus service connects passengers with Amtrak's Capital Corridor, Coast Starlight, California Zephyr, and San Joaquin routes.

### 3.1.3.5 Private Tour Operators

Grayline Tours is the largest private tour operator at the Transbay Terminal. The company offers day trips around the city and to regional tourist destinations including Muir Woods, Napa and Sonoma Valleys, Monterey Bay, and Yosemite National Park. Tour buses for day trips board passengers at five bus bays on the bus deck level. During the peak summer season, a maximum of 40 buses board and alight at the Transbay Terminal. During the winter, a minimum of 25 daily buses uses the Terminal. In 2000, passenger counts varied from 2000 daily passengers in the summer to 200 to 300 during the winter.[5]

Other tour operators offer a smaller scale of service from the Transbay Terminal. During the peak summer season, Silverstar Tours operates about 13 daily trips to Reno, Lake Tahoe, Monterey, and Napa Valley. Approximately 150 daily passengers board on First Street, just west of the Transbay Terminal. Green Tortoise Adventure runs between three and four weekly tours throughout the West Coast. Passengers board during weekday evenings from Natoma Street between First and Fremont.

## 3.1.4 Existing Transit Service Utilization Versus Capacity

Transit has become increasingly important as a travel mode for persons going to and from downtown San Francisco because of constrained roadway capacity. The current utilization and potential capacity of the various transit modes providing access to the city were analyzed to establish available transit capacity. The analysis period was the evening peak commute hours of 4:00 to 6:00 p.m., the busiest part of the typical workday. For persons beginning and ending their trips in San Francisco, four surface and subway corridors within the city were identified that included the major bus and rail lines providing local transit service. These corridors are in the vicinity of the downtown; services are operated primarily by either Muni or BART (San Francisco-Daly City Colma trains).

For persons traveling through the study area with a trip origin or destination outside of San Francisco, three regional corridors were identified. The major transit operators in the regional corridors are Caltrain, BART, AC Transit, SamTrans, Golden Gate Transit (bus and ferry), and the various ferry services to the East Bay and North Bay.

[5] Interview with Grayline representative, June 4, 2001.

For all transit routes in these local and regional corridors, the number of evening riders outbound from San Francisco was estimated at the maximum load point (i.e., the point of highest demand) from available data sources and aggregated to obtain a total demand for each transit line and travel corridor. This is referred to as a demand screenline analysis. As a counterpart to the demand in a corridor, the service capacity of each transit route was also estimated, by multiplying the passenger capacity standard for transit vehicles by the number of transit trips scheduled during the evening peak. The ridership demand was compared to the capacity provided and expressed as a percent utilization of available capacity. Demand/capacity utilizations were also calculated for each corridor and the local and regional screenlines combined.

Tables 3.1-12 and 3.1-13 provide a summary of this analysis. As shown, the estimated current utilization of local transit capacity is around 70 percent. The estimated current utilization of regional transit capacity provided from San Francisco in the evening peak is approximately 72 percent.

**Table 3.1-12: Existing Outbound PM Peak Period Transit Demand and Transit Capacity San Francisco Screenline Corridor**

| Screenline | Transit Line (1) | Ridership (2) | Existing Capacity | Capacity Utilization |
|---|---|---|---|---|
| **Northeast** | | | | |
| Kearny/Stockton | Muni 30, 30X, 45 | 3,695 | 5,222 | 71% |
| All other lines | Muni 32, 41, 422, 82X | 1,576 | 3,413 | 46% |
| **TOTAL NORTHEAST** | | **5,271** | **8,635** | **61%** |
| **Northwest** | | | | |
| Geary Corridor | Muni 38, 38L, 38AX, 38BX | 4,181 | 5,885 | 71% |
| All other lines | Muni 1, 1AX, 2, 3, 4, 5, 21, 31, 31AX, and 31BX | 9,927 | 13,979 | 71% |
| **TOTAL NORTHWEST** | | **14,108** | **19,863** | **71%** |
| **Southwest** | | | | |
| Subway Lines | Muni Metro K, L, M, and N | 8,764 | 11,781 | 74% |
| All other lines | Muni 6, 7, 66, 71L, F | 2,348 | 3,661 | 64% |
| **TOTAL SOUTHWEST** | | **11,112** | **15,442** | **72%** |
| **Southeast** | | | | |
| Mission Street Corridor | Muni 14, 14L and 14X | 1,946 | 2,650 | 73% |
| Third Street Corridor | Muni 15 | 707 | 1,191 | 59% |
| All other lines | Muni 14, 14L and 14X | 3,304 | 4,339 | 76% |
| **TOTAL SOUTHEAST** | | **5,958** | **8,180** | **73%** |
| **TOTAL SAN FRANCISCO SCREENLINES** | | **36,449** | **52,120** | **70%** |

**Notes:**
(1) Lines reaching maximum load point going outbound towards screenline.
(2) Ridership refers to outbound passenger loads at the maximum load point between 4PM and 6PM.

**Sources:** San Francisco County Transportation Authority, Wilbur Smith Associates, 2001

In contrast to other transit operators, Muni has established a capacity utilization service standard of 1.0 which includes not only seating capacity but also substantial numbers of standees, with standees representing somewhere between 30 to 80 percent of seated passengers, depending upon the specific transit vehicle configuration. Thus, Muni screenlines and sub-corridors at or near 100 percent of capacity operate under noticeably crowded conditions with many standees. Because each screenline and most sub-corridors include several Muni lines with multiple transit vehicles from each line, some individual transit vehicles operate at or above 100 percent of capacity and are extremely crowded during the PM peak hour at their most heavily used points (i.e., screenlines), while others operate under less crowded conditions. Moreover, the extent of crowding is accentuated whenever target headways are not met through either missed runs and/or bunching in service. Thus, in common with other types of transportation operations such as roadways and parking facilities, transit operators may experience substantial problems in service delivery well short of established service capacity standards.

**Table 3.1-13: Existing Outbound PM Peak Period Transit Demand & Capacity – Regional Screenlines**

| Regional Transit Screenline | Ridership | Existing Capacity | Capacity Utilization |
|---|---|---|---|
| **East Bay:** | | | |
| AC Transit | 3,143 | 4,896 | 64% |
| BART | 17,537 | 14,560 | 120% |
| Ferry | 646 | 1,629 | 40% |
| **TOTAL EAST BAY** | 21,326 | 21,085 | 101% |
| **North Bay:** | | | |
| GGT Bus | 3,132 | 5,339 | 59% |
| GGT Ferry | 755 | 2,410 | 31% |
| **TOTAL NORTH BAY** | 3,886 | 7,749 | 50% |
| **South Bay:** | | | |
| SamTrans | 785 | 1,083 | 72% |
| BART | 3,157 | 10,360 | 30% |
| Caltrain | 1,900 | 2,900 | 66% |
| **TOTAL SOUTH BAY** | 5,842 | 14,343 | 41% |
| **GRAND TOTAL** | **31,054** | **43,177** | 72% |

**Notes:** Ridership and capacity for outbound trips (away from downtown San Francisco) for the weekday PM Peak hour (typically 5:00 – 6:00 PM) based on information obtained from each of the regional transit carriers.

**Sources:** BART, AC Transit, Golden Gate Transit, SamTrans, Wilbur Smith Associates, July 2001

### 3.1.5 Future Rail Transit and Bus Service

This section outlines the future year improvements to rail and bus transit services in the study area.

### 3.1.5.1 Caltrain Service Improvements

The JPB has programmed substantial service increases to over 114 daily trains in the San Francisco to San Jose segment and over 20 daily trains in the San Jose to Gilroy segment within the next 10 years. For a comprehensive description of Caltrain's planned operations and capital improvements, see Section 2.1, No-Project Alternative.

### 3.1.5.2 BART Extension to San Francisco International Airport

*With its opening on June 22, 2003, the* BART – San Francisco International Airport (SFO) Extension *extends* BART service from its *previous* southern terminus at the Colma Station to SFO. The extension *also serves* a new Millbrae intermodal station, which *enables* transfers between BART and Caltrain. For additional information about the SFO extension, see Section 1.4.1, BART Extension to San Francisco International Airport, and 1.4.2, Millbrae Intermodal Station.

### 3.1.5.3 *Third Street Light Rail Project*

*The Third Street Light Rail Project will provide new light rail service from the Bayshore area to Chinatown. The first phase – the initial operating segment (IOS) – is currently under construction and will extend Muni service from Fourth and King Streets south across the Fourth Street Bridge, running along Third Street and Bayshore Boulevard and ending at the Bayshore Caltrain Station in Visitation Valley.* The 5.4 miles of new rail *for the IOS* will be constructed primarily in the center of the street to improve safety and reliability. Nineteen stops will be provided. Bus service changes connected with the Third Street light rail line include elimination of the 15-Third, extensions of the 9,9X, 9AX, 9BX, 36 and 43 lines to cover portions of the 15-Third not covered by the new light rail and rerouting of the 54 Felton.

Muni and the City and County of San Francisco are actively pursuing funding for construction of the *Phase 2 of the Project – the New* Central Subway. The proposed light rail service will be extended north from the Third Street Light Rail Service at King Street along Third Street, entering a new Central Subway near Bryant Street, crossing beneath Market Street and running under Geary and Stockton Streets to Stockton and Clay Streets. A total of four underground subway stations will be built at Moscone Center, Market Street, Union Square, and Clay Street in Chinatown. A surface station will be built at Third and King.

*The New Central Subway alignment in the South of Market area under Third Street will be built complete with junction connections for the Geary subway branch to Transbay Terminal. (See the following subsection for a discussion of the Geary Corridor options.) The proposed train mezzanine level of the new Transbay Terminal would have sufficient space and would be designed so as not to preclude Muni Metro tracks leading from the proposed 3rd Street and Geary Corridor alignments. Figure 3.1.7 shows possible alignments for this connection from 3rd Street into the new Transbay Terminal. Continued coordination with Muni during the design phase of the Terminal Project will result in an alignment that can be accommodated within the Terminal.*

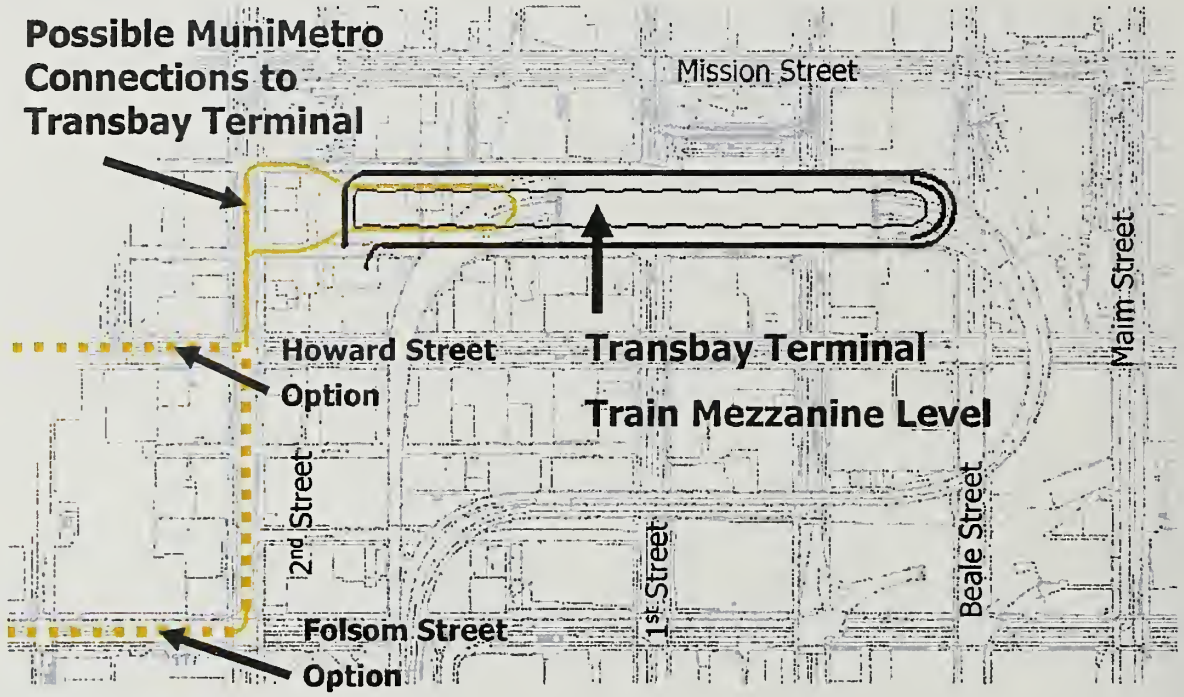



**Figure 3.1-7: Possible Future Muni Metro Connections to Transbay Terminal**

**Source:** *Project Development Phase, Final Report and Executive Summary, Transbay Terminal Improvement Plan,* Figure 2 (March 2001), and *Comment Letter from Jose Cisneros, Deputy General Manager for Capital Planning &*

### *3.1.5.4 Geary Rail or Bus Project*

*The Geary Rail or Bus Project is proposed in the project area. Muni performed a Geary Corridor Planning study in 1994 and 1995 recommending completion of a Major Investment Study (MIS) and EIS/EIR with three alternatives:*

- *"Light Rail, all-surface configuration (to Transbay Terminal on a street alignment basically the same as discussed for the E and F-lines in these comments).*
- *"Light Rail, surface configuration west of Laguna, subway east of Laguna*
- *"Trolley Coach, surface configuration west of Laguna, subway east of Laguna*

*"The Geary alternatives with subway configurations contain several proposed downtown routings for the subway. The most likely alternative is for the Geary line to use the Central Subway in the downtown area through the Union Square area and then into South-of-Market, with a branch off of the Central Subway at 3rd Street & Folsom (or Howard) for the Geary line,*

*proceeding easterly under Folsom (or Howard) Street to Beale, directly behind the Transbay Terminal. One of the alternatives also included the Central Subway branch coming to the surface on either Folsom or Howard.*

*At the time the study was performed, Muni's governing board, the Public Transportation Commission (PTC), accepted the report and elected not to move forward to an MIS and EIS/EIR until a viable financial plan could be developed. The PTC also elected not to select a preferred mode and alignment.*

*A Geary project is one of the four corridors listed in the San Francisco County Transportation Authority's 'Four Corridor Plan', and is also included in Muni's recent publication 'A Vision for Rapid Transit in San Francisco', and has been included in Muni's Short Range Transit Plan.*

#### 3.1.5.5 Other Muni Service Changes

In February 2001, Muni began implementing the South of Market Action Plan, a series of service changes including the partition of the 42-Downtown Loop into the 47-Van Ness and the 10-Townsend, expanded service and frequencies on the 12-Folsom, and extension of the 19-Polk to Townsend Street. In April 2001, a new light rail service, the S-Castro began peak period service on Market Street between the downtown and Castro stations. Also to be implemented is additional service on the 9-San Bruno line between the vicinity of San Francisco General Hospital and the Ferry Terminal on weekdays. For a summary of recent and planned changes, see Table 2.1-1.

#### *3.1.5.6 AC Transit Service Changes*

*Under the express bus alternative for increasing capacity in the Bay Bridge corridor, the MTC Bay Crossings Study[6] proposed increasing AC Transit Transbay service to approximately 150 buses in the peak hour. Because the capacity of the current Transbay Terminal is about 130 buses per hour, the full potential of this proposed service increase could not be realized except in a new Transbay Terminal. Table 3.1-14 summarizes the route structure, which follows the current routes listed in Table 3.1-9. In addition, CCCTA would add two express bus routes from Moraga and Pleasant Hill, which would increase the Transbay bus service by eight more bus trips in the peak hour.*

#### *3.1.5.7* SamTrans

SamTrans is planning to modify, eliminate, or consolidate certain express bus routes. SamTrans' 1999 Strategic Plan states that termination of express bus service may occur in response to BART extensions, increased service on Caltrain and greater congestion on Highway 101.

[6] Metropolitan Transportation Commission, *San Francisco Bay Crossings Study, Final Report*, July 2002.

**Table 3.1-14: Proposed Future AC Transit Transbay Bus Service**

| Line | Headways | | | No. of Trips | No. of Seats | Total | | | Veh Hrs | Last Trip-PM |
|---|---|---|---|---|---|---|---|---|---|---|
| | AM Peak | Base | PM Peak | | | Capacity/Hr | Nite | Owl | | |
| A | | | | | | | | 60 | 5 | |
| B | 15 | | 12 | 5 | 285 | 325 | | | 40 | 7:00 |
| BX | 15 | | 12 | 5 | 285 | 325 | | | | 7:00 |
| C | 15 | 30 | 12 | 5 | 285 | 325 | 30 | | 55 | 11:59 |
| CB | 15 | | 12 | 5 | 285 | 325 | | | 30 | 8:00 |
| E | 20 | | 15 | 4 | 228 | 260 | | | 30 | 7:30 |
| F | 20 | 30 | 15 | 4 | 228 | 260 | 30 | | 120 | 11:59 |
| FS | 20 | | 15 | 4 | 228 | 260 | | | | 6:45 |
| G | | | | | | | | | | 7:00 |
| GA | 15 | 15 | 12 | 5 | 285 | 325 | 30 | | 70 | 11:59 |
| GB | 15 | 15 | 12 | 5 | 285 | 325 | 30 | | 70 | 11:59 |
| H | 15 | | 15 | 4 | 228 | 260 | | | 52 | 7:00 |
| HX | 30 | | 30 | 2 | 114 | 130 | | | | 7:00 |
| K | 15 | | 15 | 4 | 228 | 260 | | | 80 | 7:00 |
| KH | 15 | | 15 | 4 | 228 | 260 | | | | 7:00 |
| L | 15 | | 15 | 4 | 228 | 260 | | | | 7:45 |
| LA | 10 | 15 | 7.5 | 8 | 456 | 520 | 30 | | 80 | 11:59 |
| LB | 15 | | 15 | 4 | 228 | 260 | | | 140 | 7:00 |
| LC | 15 | | 15 | 4 | 228 | 260 | | | | 7:15 |
| LD | 20 | | 15 | 4 | 228 | 260 | | | 32 | 6:15 |
| N | | | | | | | 30 | | 350 | 11:59 |
| NL | 15 | 15 | 15 | 4 | 228 | 260 | | | | 7:00 |
| NG | 20 | | 15 | 4 | 228 | 260 | | | | 7:00 |
| NF | 20 | | 15 | 4 | 228 | 260 | | | | 6:45 |
| NH | 20 | | 15 | 4 | 228 | 260 | | | | 7:00 |
| NV | 30 | | 15 | 4 | 228 | 260 | | | | 6:15 |
| O | 15 | 30 | 15 | 4 | 228 | 260 | 60 | | 135 | 11:59 |
| OX | 15 | | 15 | 4 | 228 | 260 | | | | 8:00 |
| OX1 | 30 | | 30 | 2 | 114 | 130 | | | | 5:00 |
| P | 15 | | 7.5 | 8 | 456 | 520 | | | 70 | 7:30 |
| RCV | 20 | | 20 | 3 | 171 | 195 | | | 24 | 7:00 |
| S | 20 | | 15 | 4 | 228 | 260 | | | 120 | 7:00 |
| SA | 20 | | 15 | 4 | 228 | 260 | | | | 7:00 |
| SB | 15 | 15 | 15 | 4 | 228 | 260 | 30 | | | 11:59 |
| V | 15 | | 15 | 4 | 228 | 260 | | | 55 | 7:30 |
| W | 15 | | 15 | 4 | 228 | 260 | | | 46 | 7:00 |
| WA | 15 | | 20 | 3 | 171 | 195 | | | | 6:00 |
| Y | 15 | | 20 | 3 | 171 | 195 | | | 5 | 6:00 |
| Z | 15 | | 20 | 3 | 171 | 195 | | | | Reverse |
| Total | | | | 150 | 8,550 | 9,750 | | | 1,609 | |

*Notes:*
*Assumes 50 seats per bus currently; 57 seats per bus proposed -- 55 passengers with standees in present; 65 passengers with standees in future.*
*No of Seats is in peak hour.*
*Current AC Transit service (August 2002) is 96 trips in the peak hour for a total 4,775 seats and 5,253 passengers with 990 vehicle hours.*
*CCCTA transit services would add 8 express buses in the peak hour across the bridge from routes serving Moraga and Pleasant Hill.*
*The Transbay Terminal is not replaced bus service would be limited to its current capacity of about 130 buses per hour.*
*Source: MTC Bay Crossing Study, Appendix A, Alternative 1: Express Bus Service, July 2002.*

#### *3.1.5.8 High-Speed Rail Service*

*Senate Bill 1856, the legislation regarding a proposed bond measure for a California High Speed Rail System, was passed by the state legislature and signed by the Governor in 2002. The legislation states that the first phase of the proposed statewide high speed rail system shall be "Between San Francisco Transbay Terminal and Los Angeles Union Station." Plans for high-speed rail are being coordinated with the proposed Caltrain extension, which would provide the tracks and platforms for the high-speed rail service north of the 4th and Townsend Station area. According to the California High Speed Rail Authority, the San Francisco station is projected to attract up to 43,000 high-speed rail boardings and alightings per day in 2020.*

### 3.1.6 PROJECTED CALTRAIN PATRONAGE AND ACCESSIBILITY IMPROVEMENTS

This section outlines future Caltrain patronage forecasts and transit travel times with and without the Caltrain Extension project. Caltrain's current and projected daily boardings and alightings by station for 2001 and 2020 are shown in Table 3.1-15. The 2001 data are for February 2001.[7]

*The ridership forecast was modified to account for a projected level of 132 trains per day in 2020 instead of the previously analyzed 170 trains per day. The result was a decrease in daily ridership of one tenth of one percent, less than 200 daily ons and offs out of approximately 128,000 daily ons and offs projected for 2020. Because the 132-train concept would be concentrated in the peak periods with a maximum level of service while reducing service in the off-peak and evening periods, the projected ridership gain in the peak periods is projected to nearly compensate for the losses in the off-peak and evening periods, resulting in a negligible decrease in ridership compared with that presented in Table 3.1-14 of the Draft EIS/EIR. Thus the ridership numbers in the Final EIS/EIR have not been changed from those presented in the Draft EIS/EIR.*

#### 3.1.6.1 Caltrain Ridership Under No-Project Alternative

As shown in Table 3.1-*15*, Year 2020 ridership at the Fourth and Townsend Station is projected to be less than in 2001 because of expected transfers to and from BART at the new Millbrae intermodal station. But Caltrain ridership is expected to grow by *40* percent system wide. For the No-Project Alternative under a *132*-train Caltrain weekday schedule, the system is projected to carry approximately 50,000 riders. This ridership level is substantially higher than the *2001* level of 35,600 riders.

[7] Caltrain On-Board Survey, February 2001.

**Table 3.1-15: Caltrain Daily Boardings and Alightings Existing, 2020 No Project, and with Downtown Extension**

| Station | 2001 | 2020 No-Project | 2020 Extension to Transbay Terminal |
|---|---|---|---|
| Transbay Terminal | 0 | 0 | 29,307 |
| Fourth & Townsend | 13,611 | 12,950 | 3,098 |
| 22nd Street | 1,334 | 1,716 | 1,706 |
| Paul Avenue | 49 | 49 | 51 |
| Bayshore | 1,021 | 1,366 | 1,427 |
| South San Francisco | 1,360 | 1,879 | 2,173 |
| San Bruno | 1,728 | 2,334 | 2,657 |
| Millbrae | 1,801 | 8,370 | 5,948 |
| Broadway | 1,117 | 1,524 | 1,841 |
| Burlingame | 1,811 | 2,448 | 3,035 |
| San Mateo | 2,754 | 3,652 | 4,645 |
| Hayward Park | 1,205 | 1,627 | 1,938 |
| Hillsdale | 2,820 | 4,126 | 5,791 |
| Belmont | 1,741 | 2,348 | 2,933 |
| San Carlos | 2,453 | 3,408 | 4,011 |
| Redwood City | 3,607 | 4,835 | 5,730 |
| Atherton | 574 | 800 | 904 |
| Menlo Park | 2,623 | 3,861 | 4,439 |
| Palo Alto | 4,560 | 6,217 | 7,311 |
| California Avenue | 2,766 | 3,604 | 4,048 |
| San Antonio | 1,598 | 2,217 | 2,539 |
| Mountain View | 4,428 | 6,697 | 7,375 |
| Sunnyvale | 2,842 | 4,067 | 4,439 |
| Lawrence | 2,610 | 3,857 | 4,096 |
| Santa Clara | 2,248 | 3,258 | 3,368 |
| College Park | 437 | 532 | 547 |
| San Jose | 3,590 | 5,534 | 5,686 |
| Tamien | 1,612 | 2,206 | 2,237 |
| Capital | 228 | 308 | 311 |
| Blossom Hill | 348 | 547 | 551 |
| Morgan Hill | 793 | 1,258 | 1,259 |
| San Martin | 435 | 570 | 570 |
| Gilroy | 1,102 | 1,948 | 1,949 |
| Total Entries + Exits | 71,206 | 100,115 | 127,921 |
| **System Entries** | 35,603 | 50,057 | 63,960 |

**Source:** Caltrain February 2001 Ridership Survey; Parsons Ridership Forecast, August 2001

### 3.1.6.2 Caltrain Ridership Under Caltrain Downtown Extension Alternative

Table 3.1-*15* also shows Caltrain projected daily boardings and alightings by station for the year 2020 with the proposed Caltrain Downtown Extension which would extend Caltrain to the Transbay Terminal site. For a *132*-train weekday schedule, ridership is projected to increase to 64,000 trips per day, an increase of 13,900 trips over the projected 2020 No-Project ridership, and of 80 percent over the February 2001 ridership of 35,600 trips per day. Ridership at the San Francisco terminal is likewise projected to increase, from 13,000 to 29,300 daily boardings and alightings if the terminal station were moved from Fourth and Townsend Streets to the Transbay Terminal site. An additional 3,100 daily boardings and alightings are projected for a Fourth and Townsend/Mission Bay Station, which would be located in the vicinity of the existing Caltrain terminal. Incremental increases in ridership are projected for all other Caltrain stations except those south of the Tamien Station in San Jose.

*The extension would decrease the number of transfers to BART at Millbrae, as former Caltrain riders that switched to BART with the opening of the Millbrae BART extension switch back to Caltrain upon extension of Caltrain to the Transbay Terminal. The projections did not assume completion of the proposed BART extension to Santa Clara by 2020. Based on VTA projections, implementation of the extension could possibly lower Caltrain ridership by 2,000 to 3,000 riders per day, mostly at the San Jose end of the corridor.*

### 3.1.6.3 Projected Travel Times/Accessibility With and Without the Caltrain Downtown Extension

Table 3.1-*16* shows travel time comparisons on Caltrain for selected trips between central origins and destinations in the cited cities.[8] These travel time estimates are taken directly from the patronage model, where they are used to determine ridership levels. The travel times include access, wait, transfer, and ride times at both ends of the trip for four selected origins and destinations for the year 2001 and projected for the year 2020. The travel time savings under the No-Project scenario can be attributed to Caltrain Rapid Rail Program improvements currently underway along the Caltrain railroad, such as track rehabilitation and other infrastructure improvement, electrification, and the increase in the number of weekday trains from 78 to *132*.

With the Caltrain Downtown Extension, travel time savings for selected trips are projected to be 13 to 15 minutes compared to No-Project conditions, except for trips beginning in the San Francisco Airport, for which the time savings are projected to be 10 minutes.

[8] Including transfers to other service providers as appropriate for the respective trip ends.

**Table 3.1-16: Estimated Transit Travel Times for Selected Trips on Caltrain***

| Origin | Destination | Travel Time (hour: min) | | | Projected Travel Time Savings (minutes) |
|---|---|---|---|---|---|
| | | 2001 | 2020 No-Project | 2020 Extension to Transbay Terminal | |
| Downtown San Jose | Downtown San Francisco | 2:05 | 1:39 | 1:24 | 15 |
| Sunnyvale | Downtown San Francisco | 1:51 | 1:40 | 1:26 | 14 |
| Palo Alto | Downtown San Francisco | 1:36 | 1:17 | 1:02 | 15 |
| Millbrae | Downtown San Francisco | 1:08 | 0:52 | 0:37 | 15 |
| San Bruno | Downtown San Francisco | 1:04 | 0:54 | 0:40 | 14 |
| Downtown San Francisco | San Francisco Airport | 1:11 | 0:56 | 0:47 | 10 |
| Redwood City | Concord | 2:26 | 2:13 | 1:59 | 14 |
| Downtown Oakland | San Carlos | 1:41 | 1:28 | 1:15 | 13 |

Notes: *The travel times are for average peak-direction conditions and include access, wait, transfer, and ride times at both ends of the trips between central origins and destinations in the cited cities. *The trips assume use of Muni for connections to downtown San Francisco and use of BART from the Embarcadero Station for trips to Concord and from Oakland.*

Source: Parsons Ridership Model, September 2001.

## 3.2 VEHICULAR TRAFFIC

This section describes the regional roadways and local streets in the project area and traffic conditions on those facilities.

### 3.2.1 REGIONAL ROADWAYS IN CORRIDOR

The study area is served by three freeways -- Interstate 80, Interstate 280, and U.S. Highway 101. These are all limited-access, divided facilities and are described further below.

#### 3.2.1.1 Interstate 80 (I-80)

I-80 is oriented east-west across the country from San Francisco to New York City. The San Francisco - Oakland Bay Bridge is part of the I-80 system, connecting San Francisco to the East Bay. The Bay Bridge has five lanes eastbound and five lanes westbound. The portion of I-80 between U.S. 101 and the Bay Bridge that crosses the project area exists as an eight-lane facility. Existing daily traffic volumes in this segment range from 218,000 vehicles to 232,000 vehicles. The Bay Bridge carries approximately 290,000 vehicles per day. During the peak hour, Caltrans estimates I-80 carries nearly 20,000 vehicles in the segment between U.S. 101 and the Bay Bridge.

### 3.2.1.2 Interstate 280 (I-280)

I-280 passes near the western end of the study area, serving South San Francisco and western Peninsula cities. The freeway runs north-south and extends from San Francisco southward to San Jose. I-280 and U.S. 101 cross south of downtown San Francisco. Just south of where U.S. 101 crosses, daily traffic volumes on I-280 are 164,000 vehicles per day, with daily volumes of 230,000 vehicles per day at the Pacifica exit. Ramp connections to I-280 from King Street provide direct connections to The Embarcadero adjacent to the existing Caltrain Terminal at Fourth and King Streets.

### 3.2.1.3 U.S. Highway 101 (U.S. 101)

U.S. 101 passes south and west of the study area, serving San Francisco, the Peninsula, and San Jose. It extends north to the Golden Gate Bridge, Marin County and beyond to the Seattle area, and south through the state to Los Angeles. It is primarily an eight-lane facility south of I-80 and along the Peninsula. From the southern San Francisco city limits to I-80, the average daily traffic ranges from 245,000 to 255,000 vehicles, with the highest volumes near the I-80 junction. In San Mateo County, the average daily traffic volumes range from 181,000 to 275,000 vehicles, with the highest volumes near the interchange with State Route 92 and in the vicinity of the San Francisco International Airport.

In Santa Clara County, U.S. 101 average daily traffic volumes are highest near San Jose (reaching about 248,000 vehicles) and around Mountain View near State Route 85 (about 246,000 vehicles). The traffic volumes are lowest in the southern part of Santa Clara County, with average daily volumes around 83,000 vehicles in Gilroy.

### 3.2.1.4 El Camino Real

In addition to the three freeways described above, State Route 82 (El Camino Real) runs north-south in the Caltrain corridor, serving the Peninsula cities. El Camino Real is the only continuous arterial street serving the entire length of the Peninsula, and carries up to 3,000 vehicles during the peak hour in some segments near the Caltrain stations in Millbrae and San Bruno. Many of the Caltrain stations have access to El Camino Real or a nearby parallel road.

## 3.2.2 The Street Network in the Project Area

The boundaries of the traffic study area are Market Street to the north, Third Street to the west, Bryant Street to the south, and the San Francisco Bay to the east. This area is the primary focus of the traffic evaluation for the Terminal / Extension / Redevelopment project.

The study area has a well-developed street system between Market and Bryant Streets. Streets are primarily one-way, and block lengths are usually between 425 to 900 feet in the east-west direction and 300 to 600 feet in the north-south direction. According to the Transportation

Element of the San Francisco General Plan, the primary northbound and southbound arteries are Main, Beale, Third, Fourth, Fifth, and Sixth Streets. Main and Third Streets provide one-way northbound traffic, and Beale and Fourth Streets provide one-way southbound traffic. Fifth and Sixth Streets are used for two-way traffic.

Primary east-west arteries include Howard, Folsom, Harrison, and Bryant Streets, and a portion of King Street. Folsom Street is currently a four-lane eastbound street except from The Embarcadero to Main Street, where it becomes a two-way street, with three lanes eastbound and one lane westbound. Bryant Street is also one-way eastbound, except for the portion east of Sterling Street, which is two-way. Howard and Harrison Streets are one-way streets westbound; although Howard Street is two-way east of Fremont, and Harrison Street is two-way east of Third Street. King Street is used for two-way traffic.

East-west streets in the study area include Market and Mission Streets, which provide two lanes of traffic in each direction and are designated as "Transit Preferential Streets" in the San Francisco General Plan. Mission Street is a transit-preferential arterial, having one of its two lanes in the westbound direction, between Main Street and Third Street (7 a.m. to 6 p.m., weekdays) and between Fourth and Eleventh Streets (4:00 to 6:00 p.m., weekdays), dedicated as a bus-only lane. In the eastbound direction, Mission Street has a bus lane between Eleventh Street and Fifth Street (7:00 to 9:00 a.m. and 4:00 to 6:00 p.m., weekdays), and between Third Street and Beale Street (7:00 a.m. to 6:00 p.m., weekdays).

Market Street also serves as a transit-oriented arterial. It has two lanes in each direction with bus and historic trolley stops on center islands and bus stops at the curb. The left curb lanes on First Street (between Market Street and Howard Street) and on Fremont Street (between Mission Street and Market Street) are also exclusive bus lanes.

Under existing conditions, the study area contains two off-ramps from the Bay Bridge: at Fremont Street between Folsom Street and Howard Street and at Fremont and Harrison Streets. There are three I-80/Bay Bridge eastbound-on-ramps in the study area: Essex and First Streets (both at Harrison Street), and Bryant Street at Sterling Street. Access to and from the Peninsula using the I-80 freeway, that is, via on- and off-ramps at Fourth Street between Harrison and Bryant Streets, is not included in the study area. The Sixth Street I-280 on- and-off ramps at Brannan Street are also not part of the traffic study area.

### 3.2.3 EXISTING TRAFFIC CONDITIONS

This section outlines existing traffic conditions in the project area. The data were developed for the City of San Francisco to analyze the Rincon Hill, Mid-Market, SOMA, and Transbay areas.

Traffic operating conditions for surface streets in the study area are described using level of service indices. These statistics indicate the levels of congestion and delay that occur in the study area under existing conditions.

Level of Service (LOS) designations are used as qualitative descriptors of an intersection's performance based on traffic delays. An intersection's LOS could range from A, representing free-flow conditions, to F, representing jammed conditions, corresponding to average delay, as follows.

**Level of Service for Intersections**

| Level of Service | Average Vehicle Delay (Seconds per Vehicle) |
|---|---|
| A | $\leq 5.0$ |
| B | 5.1 to 15.0 |
| C | 15.1 to 25.0 |
| D | 25.1 to 40.0 |
| E | 40.1 to 60.0 |
| F | $\geq 60.0$ |

Table 3.2-1 presents the LOS for base year (existing) conditions at key intersections in the study area. The table indicates that, under base year conditions, the 27 signalized intersections analyzed operate at an acceptable LOS (D or better) during the weekday morning and evening peak commute hours, with the exception of five intersections: First/Folsom, Second/Harrison, Essex/Harrison, First/Harrison, and Second/Bryant.

**Table 3.2-1: PM Peak-Hour Intersection Delay (seconds per vehicle) and Level of Service (LOS) Summary Existing (2001) and Projected 2020 No Project Traffic Conditions**

| Intersection | 2001 | | 2020 No Project | |
|---|---|---|---|---|
| | Delay | LOS | Delay | LOS |
| 1. First/Market | 25.9 | D | 34.8 | D |
| 2. Fremont/Market | 15.2 | C | 27.1 | D |
| 3. Second/Mission | 10.2 | B | 16.0 | C |
| 4. First/Mission | 27.1 | D | **59.5** | **E** |
| 5. Fremont/Mission | 21.8 | C | 22.8 | C |
| 6. Beale/Mission | 14.9 | B | 20.0 | C |
| 7. Main/Mission | 15.6 | C | 21.9 | C |
| 8. Second/Howard | 12.3 | B | 25.7 | D |
| 9. First/Howard | 31.9 | D | **42.1** | **E** |
| 10. Fremont/Howard | 20.1 | C | 29.4 | D |
| 11. Beale/Howard | 16.2 | C | 28.7 | D |
| 12. Main/Howard | 15.4 | C | 25.2 | D |
| 13. Spear/Howard | 13.9 | B | 15.5 | C |
| 14. Second/Folsom | 32.5 | D | **>60** | **F** |
| 15. First/Folsom | **>60** | **F** | **>60** | **F** |
| 16. Fremont/Folsom | 7.7 | B | 22.8 | C |
| 17. Beale/Folsom | 14.5 | B | 14.7 | B |
| 18. Main/Folsom | 12.1 | B | 15.6 | C |
| 19. Spear/Folsom | 11.1 | B | 13.3 | B |
| 20. The Embarcadero/Folsom | 18.2 | C | 31.3 | D |
| 21. Second/Harrison | **44.9** | **E** | **>60** | **F** |
| 22. Essex/Harrison | **>60** | **F** | **>60** | **F** |
| 23. First/Harrison | **>60** | **F** | **>60** | **F** |
| 24. Fremont/Harrison | 37.0 | D | **47.8** | **E** |
| 25. Main/Harrison | 32.0 | D | **>60** | **F** |
| 26. Spear/Harrison | 15.4 | C | 22.9 | C |
| 27. Second/Bryant | **>60** | **F** | **>60** | **F** |

**Sources:** San Francisco County Transportation Authority, Wilbur Smith Associates, September 2001

### 3.2.4 FUTURE STREET NETWORK IN PROJECT AREA

The following roadway improvements are not part of the proposed Terminal / Extension / Redevelopment project, but are expected to be in place by the year 2020. Most of these changes would be related to the roadway improvements called for under the San Francisco Department of Parking and Traffic (DPT) Variant Alternative, selected by the San Francisco Board of Supervisors as the Locally Preferred Alternative for the replacement of the Embarcadero Freeway and the Terminal Separator Structure.

- The existing I-80 Fremont Street off-ramp would be modified. Design for this off-ramp is currently under discussion between Caltrans and the City/County of San Francisco.

- First Street would be restriped between Howard and Harrison Streets to provide a new peak-hour only left-side transit lane against the east curb. Left turns from First Street onto Harrison Street would be allowed in this transit lane during peak hours.

- Harrison Street would be re-striped to one-way westbound, from First Street to Third Street.

- When warranted by congestion levels in the future (sometime before the year 2015), the existing evening peak-period carpool operation on the Bryant Street approaches to the Sterling Street on-ramp would be changed to mixed-flow operation, and the current mixed-flow operation on the Essex Street approach to the Bay Bridge would be restricted to HOV operation during the evening peak period.

### 3.2.5 FUTURE TRAFFIC CONDITIONS: NO-PROJECT ALTERNATIVE

Table 3.2-1 presents the current 2001 and projected 2020 No-Project LOS conditions for the 27 study intersections during the evening peak hour. The levels of service shown reflect normal traffic conditions.

Given the high volume-to-capacity ratios estimated at the freeway on-ramps in the vicinity of the existing Transbay Terminal, the intersections near these ramps would quickly deteriorate to less than acceptable conditions (LOS E or F) in the case of an accident, construction, or a stall on the Bay Bridge or on U.S. 101, or in the case of greater traffic volumes (on the freeway or on local streets) than those projected to occur under normal conditions. The DPT estimates that "incident" conditions occur in the evening peak period about 25 percent to 30 percent of weekday evenings, and less often in the morning commute period.

Table 3.2-1 shows that five additional intersections have projected increases in delay to unacceptable levels (LOS E or F) between 2001 and 2020 for the evening peak hour. These are First/Mission, First/Howard, Second/Folsom, Second/Harrison, and Main/Harrison. Two other intersections are projected to degrade from LOS C to D between 2001 and 2020: Beale/Howard and Embarcadero/Folsom.

## 3.3 PARKING

The focused parking study area is bounded by Market Street to the north, Fourth Street to the west, Townsend Street to the south, and The Embarcadero to the east (Figure 3.3-1). This study area represents an approximate 10-minute walking distance to and from the existing Transbay Terminal site. The parking analysis focuses on off-street parking facilities such as lots and garages in the South-of-Market area.

Within the study area, the City *and the* Port as well as private entities are responsible for

managing parking. The Port of San Francisco is responsible for on-street and off-street parking resources within its jurisdiction, including spaces along The Embarcadero. The San Francisco DPT is responsible for on-street parking outside Port jurisdiction. Off-street parking resources outside Port jurisdiction are generally privately owned and managed. Some off-street parking areas are located on land owned by Caltrans, which leases lots to private operators, *usually through short term leases.*

Parking garages and surface lots are scattered throughout the study area. Most are small-to-medium in size, containing 20 to 350 parking spaces. Some larger garages also exist, with capacities of 700 spaces or more. Weekday midday and evening period field surveys were conducted in August 1999 and January 2001 by Wilbur Smith Associates to determine the occupancy rate of the parking supply in the study area. The data presented in Table 3.3-1 show an overall parking occupancy rate of 85 percent during the midday on weekdays.

**Table 3.3-1: Existing Parking within the Project Study Area**

| Type of Parking Facility | Number of Parking Facilities | Parking Spaces Available | Parking Spaces Used | Percent Occupancy [1] |
|---|---|---|---|---|
| Garage | 30 | 7,631 | 6,288 | 82% |
| Lot | 44 | 6,495 | 5,653 | 87% |
| Lot/Garage | 2 | 215 | 200 | 93% |
| Total | 74 | 14,341 | 12,141 | 85% |

Notes: [1] Weekday - midday

Source: Wilbur Smith Associates, August 1999. Field checked January and November 2001.

In addition to parking in the lots and garages, there are approximately 2,750 on-street spaces in the study area. About 200 of these spaces are under the San Francisco Port Authority's jurisdiction. The on-street parking spaces are generally relatively full during normal weekday conditions.

## 3.4 NON-MOTORIZED TRAFFIC CONDITIONS

This section reviews the existing pedestrian and bicycle conditions in the area surrounding the Transbay Terminal and includes the following analyses:

- Pedestrian levels of service at five intersections – crosswalks and corners;
- Sidewalk widths throughout the study area;
- Qualitative analysis of on-sidewalk pedestrian conditions throughout the study area;
- Origin/destination analysis of study area pedestrian traffic; and
- Bicycle access and traffic counts at five intersections.

Pedestrian conditions are presented first, followed by bicycle conditions.

**Figure 3.3-1: Parking Study Area**

### 3.4.1 PEDESTRIAN CONDITIONS

The City and County of San Francisco adopted a Downtown Streetscape Plan in 1995 that assigns a street typology to downtown roadways. The type of streets include "Special Streets," "Second Level Streets," "Destination Streets," "Walkthrough Alleys," and "Base Case Streets." The following street designations apply to the streets in the area surrounding the Transbay Terminal,

| | |
|---|---|
| Special Streets: | Mission Street |
| Second Level Streets: | Beale Street, Second Street |
| Walkthrough Alleys: | Ecker, Natoma, Minna, Garden Walk |
| Base Case: | All other streets |

The Downtown Streetscape Plan applies design guidelines and standards based on the street designations. Amenities, such as public art, banners, benches, sidewalk displays, and private street light installation are encouraged on Second Level Streets, and distinctive, decorated sidewalk elements are reserved for Special Streets.

#### 3.4.1.1 Intersection Analysis

Evening peak hour pedestrian and bicycle counts were conducted at the following five intersections:

- Mission and First Streets;
- Mission and Fremont Streets;
- Howard and First Streets;
- Howard and Fremont Streets; and
- Folsom and Beale Streets.

The first four intersections are those that immediately surround the Transbay Terminal. The fifth intersection was selected for analysis given the projected levels of future development along Folsom Street. The counts were conducted between 4:00 p.m. and 7:00 p.m. The locations of the intersections are shown in Figure 3.4-1. The Levels of Service (LOS) for the five intersections were calculated using the methodology from the 1994 update to the 1985 Highway Capacity Manual. Additional qualitative analysis follows the calculations of LOS. Crosswalk and corner LOS are measurements of the amount of space (square feet) each pedestrian has in the crosswalk or on the corner. These measurements depend on pedestrian volumes, signal timing, corner dimensions, crosswalk dimensions and roadway widths. LOS A represents free-flowing pedestrian conditions, while LOS F indicates that there are substantial restrictions to pedestrian movement and speed. Two aspects of pedestrian traffic were measured: standard flow and maximum surge conditions. Maximum surge occurs when pedestrians clump together due to sidewalk obstructions, blocking by a group of slower-moving pedestrians, a simultaneous departure or arrival by many pedestrians, or when pedestrians from either side of the crosswalk meet mid-way.

Pedestrian conditions as measured by this LOS analysis show that all the crosswalks analyzed are functioning at LOS B or better during both standard flow and surge conditions. The majority of the corners are also functioning at LOS B or better, although two of 20 corners analyzed showed LOS C. The crosswalk and corner LOS analysis is summarized in Table 3.4-1, Existing Pedestrian LOS. Figure 3.4-1 maps the intersections and their levels of service.

**Table 3.4-1: Existing Pedestrian LOS – PM Peak Conditions (Peak 15 Minutes)**

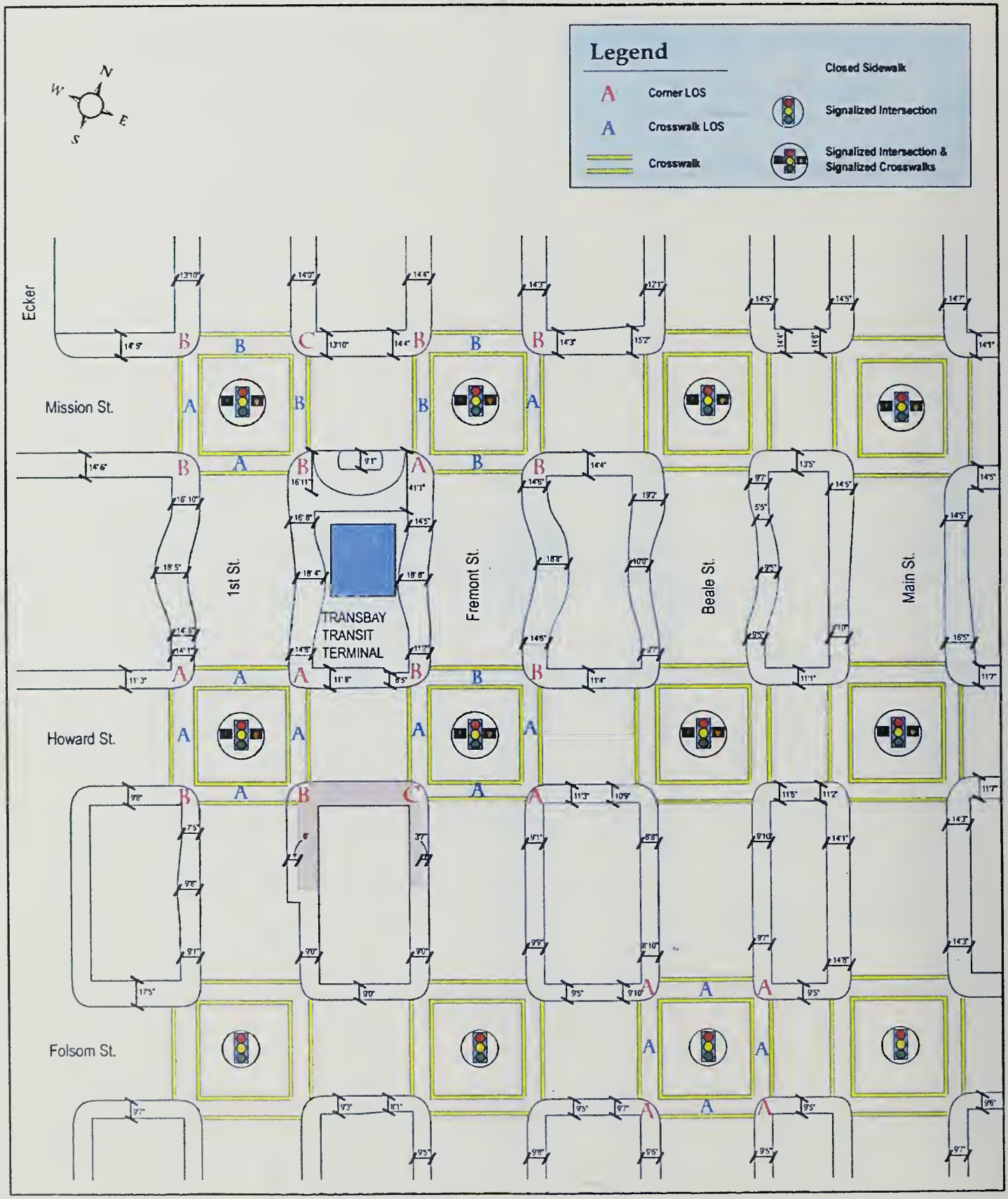
| Intersection | Cross-walk | Ped Space (sq ft/ped) | LOS | Surge LOS | Corner | Ped Space (sq ft/ped) | LOS |
|---|---|---|---|---|---|---|---|
| Mission & First | North | 64 | B | B | NW | 43 | B |
| | East | 125 | B | B | NE | 34 | C |
| | South | 193 | A | B | SW | 100 | B |
| | West | 149 | A | B | SE | 99 | B |
| Mission & Fremont | North | 109 | B | B | NW | 50 | B |
| | East | 171 | A | B | NE | 62 | B |
| | South | 75 | B | B | SW | 214 | A |
| | West | 126 | B | B | SE | 63 | B |
| Howard & First | North | 389 | A | A | NW | 118 | A |
| | East | 319 | A | A | NE | 192 | A |
| | South | 890 | A | A | SW | 103 | B |
| | West | 245 | A | A | SE | 69 | B |
| Howard & Fremont | North | 115 | B | B | NW | 80 | B |
| | East | 308 | A | A | NE | 98 | B |
| | South | 806 | A | A | SW | 35 | C |
| | West | 348 | A | A | SE | 136 | A |
| Folsom & Beale | North | 689 | A | A | NW | 211 | A |
| | East | 1083 | A | A | NE | 213 | A |
| | South | 467 | A | A | SW | 160 | A |
| | West | 508 | A | A | SE | 226 | A |

**Source:** Nelson\Nygaard pedestrian analysis, August 2001.

The southern sidewalk between Fremont and First Streets along Howard Street was closed due to construction at the time this pedestrian analysis was conducted. As a result, the sidewalk widths at the southwest corner of Howard and Fremont and the southeast corner of Howard and First have been narrowed from their traditional widths. While fewer pedestrians are using these corners due to the blocked sidewalk, the narrower holding area at each of these corners negatively impacts the LOS.

The evening peak 15-minute period varied between and within each intersection. Of the twenty corners analyzed, eight saw their peak pedestrian volumes between 5:00 p.m. and 5:15 p.m., while six peaked between 5:15 p.m. and 5:30 p.m.

| Figure 3.4-1 | Corner & Crosswalk Pedestrian Level of Service (LOS) Existing Condition |
|---|---|



### 3.4.1.2 Sidewalk Conditions

Sidewalk widths were measured in the area surrounding the Transbay Terminal from Main Street on the east to Folsom Street on the south to First Street on the west, and to Mission Street on the north. Sidewalk widths vary throughout the area and even within the same block. In general, widths range from about eight feet to 16 feet. An exception is the temporary condition created by construction on Howard Street between First and Fremont. In this area, temporary sidewalks are as narrow as four feet. Figure 3.4-2, Sidewalk Dimensions, shows a schematic of sidewalk widths throughout the area.

Some general observations about pedestrian conditions in the area are:

- Sidewalks are widest and most attractive in the northeast corner of the defined area (e.g., Main and Mission; Beale and Mission). In this area, some sidewalks feature surface detail (e.g., bricks), sidewalk tables, and well-groomed street trees.

- The further a pedestrian moves south in the defined area, the less attractive become the sidewalks. Several areas of sidewalk along Folsom Street are cracked and rutted; several sidewalk sections in the southern part of the study area feel "barren" given the parking lots, large faceless buildings and construction sites that front the street.

- The pedestrian experience along Fremont and First Streets is hampered by the Transbay Terminal structure itself. Where the terminal crosses the street, the sidewalks are wide, but they are dark and more likely to be inhabited by members of the homeless community.

- Morning traffic turning left off Folsom onto Fremont Street creates conflicts with pedestrians crossing Fremont on the north side of the intersection.

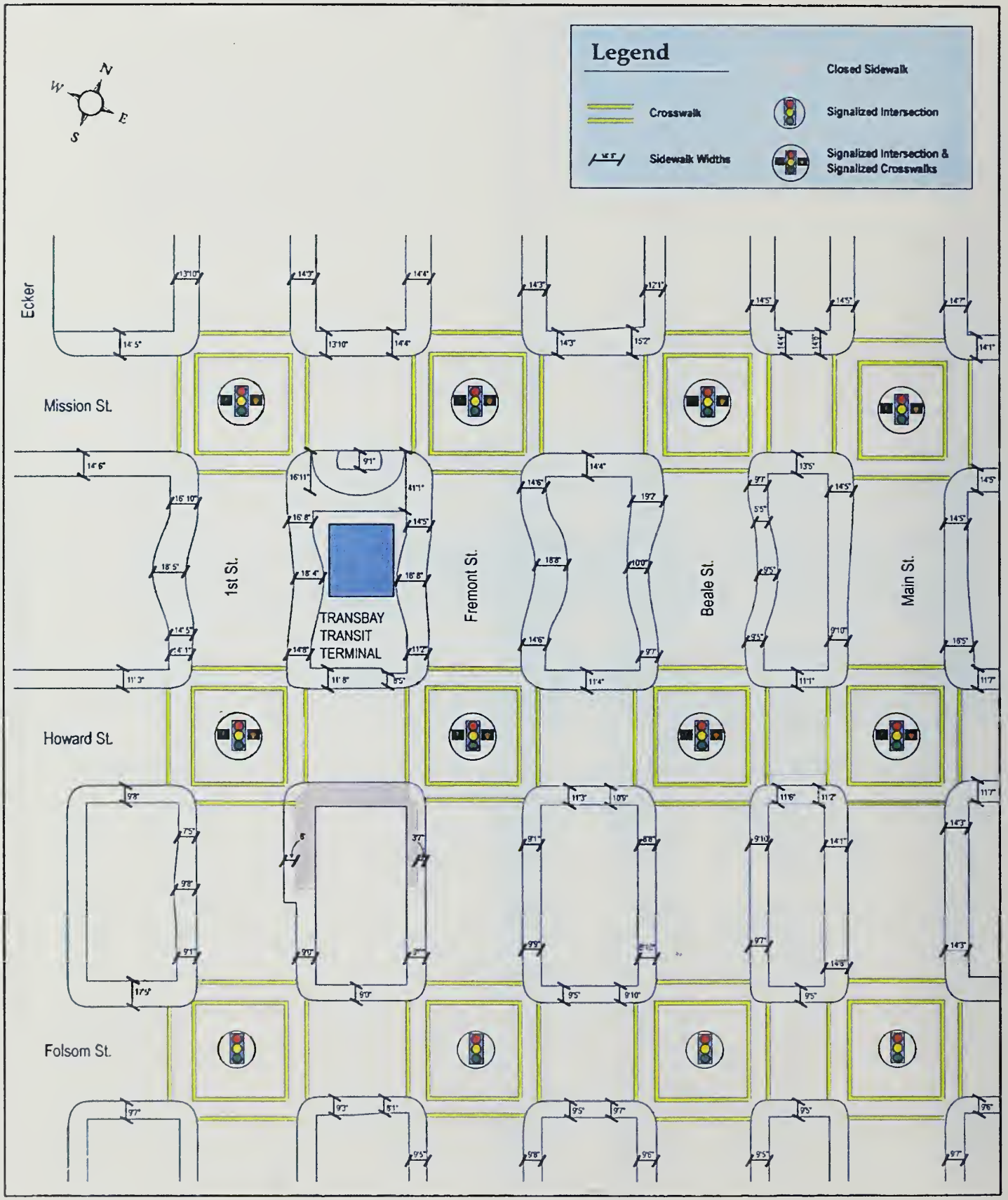
- Evening traffic turning left off Howard onto First Street creates conflicts with pedestrians crossing First Street on the south side of the intersection.

- Intersections along Folsom Street do not have pedestrian crossing signals.

- The north-south streets of First, Fremont and Beale have fewer street trees than do the east-west streets of Mission and Howard. Street trees and street furniture vary from block to block and within blocks.

- Street furniture in the area is limited to newspaper racks, trash receptacles, parking meters, and tall light stands designed for traffic lighting. While newspaper racks do not necessarily impede pedestrian flow, they often clutter the corners and many are not well maintained.

| Figure 3.4-2 | Sidewalk Dimensions |
|---|---|



### 3.4.1.3 Special Pedestrian Conditions

The following three unique pedestrian conditions occur in the Transbay Terminal area:

1. Morning unloading of casual carpoolers at Howard and Fremont Streets;
2. Evening queuing for casual carpoolers along Beale Street; and
3. Evening queuing for Golden Gate Transit buses along Mission and Fremont Streets.

**Morning Casual Carpool Unloading.** During the morning commute, many carpools unload their passengers at the intersection of Howard and Fremont Streets. Observed pedestrian flows during this morning period revealed that there is not adequate curb space for cars unloading these passengers. The situation has been temporarily exacerbated by the construction occurring on Howard Street between Fremont and First Streets. Passengers often disembark vehicles into Howard Street as cars make the turn off Fremont. The unloading of passengers creates temporary back-ups of vehicles turning left onto Howard from Fremont.

**Evening Casual Carpool Queues.** In the evenings, commuters who work in downtown San Francisco and live in the East Bay queue up along the west side of Beale Street between Folsom and Howard Streets to wait for casual carpool rides home. The pedestrian queues begin to form around 3:00 p.m. and reach their peak between 5:00 p.m. and 5:15 p.m. The line for carpools to Vallejo, Fairfield, and Suisun forms at the north end of the block closest to Howard Street and is the longest of the carpool lines. At its longest, the Vallejo/Fairfield/Suisun queue snakes up the block toward Folsom Street until it gets too close to the neighboring Hercules/Richmond queue. It then doubles back on itself, travels down the block toward Howard Street and wraps around the corner onto Howard. The carpool lines block the sidewalk, but those waiting in the queues are orderly and allow passage by through-pedestrians. There is no shelter available for waiting passengers, and some casual carpoolers wait up to an hour for a carpool ride.

By 5:15 p.m., the carpool lines have shrunk to just a few waiting commuters and by 6:00 p.m., there is no one standing in line. Instead, the waiting carpools begin to queue at the curb. At most, four cars were observed lined up at the curb, and there is adequate curb space to accommodate these vehicles. At the south end of the block, there is the potential that queued-up vehicles could block access to the Golden Gate Transit bus storage site at Howard and Main Streets. The volume of vehicles observed, however, did not approach levels that would create this condition.

**Evening Golden Gate Transit Queues.** There are three main Golden Gate Transit (GGT) queue areas, as follows:

1. The north side of Mission Street between First and Fremont Streets, near First;
2. The west side of Fremont Street just south of Mission Street; and
3. The west side of Fremont Street just north of Mission Street.

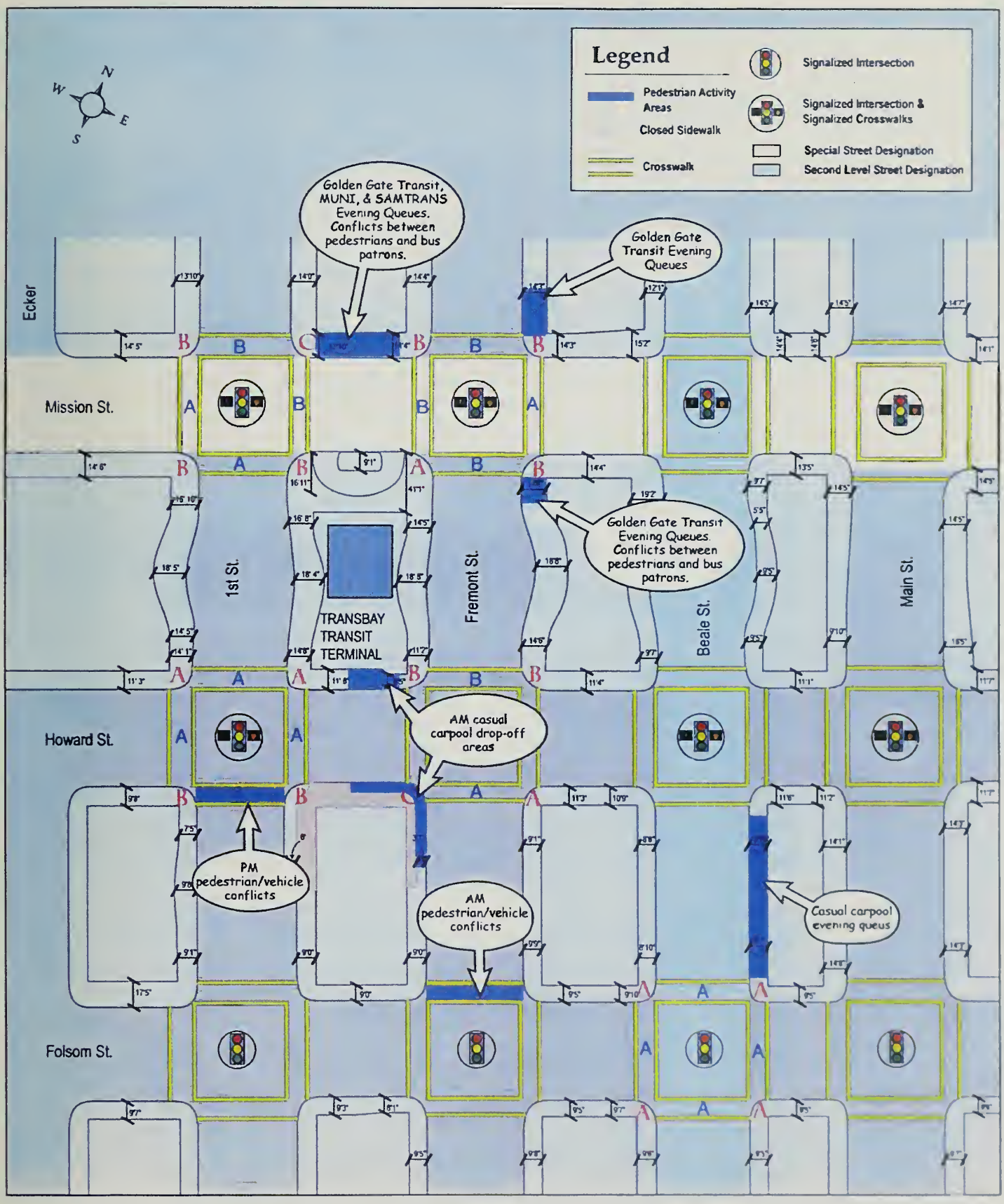
The GGT bus stops along Mission Street are well signed with a large GGT kiosk that clearly identifies which GGT buses stop where and includes some bus schedules. Passengers for GGT, SamTrans, and Muni buses line up along this 14-foot wide sidewalk area. The bus shelter is closest to First Street and to the Muni stops. It is not large enough to accommodate all waiting passengers. There is some queuing for the three bus services and sometimes it is unclear to the passenger which queue is for which bus. Overall, however, passengers line up in an orderly fashion and allow through-pedestrians to pass by. When rounding the corner from First onto Mission Street, there is some pedestrian blockage due to the location of the bus shelter and waiting passengers. This is also the corner with the highest observed peak pedestrian flows in the area (see Figure 3.4-1) and a pedestrian LOS of C.

The GGT bus stops along Fremont Street just south of Mission Street have the longest queues and create the most sidewalk congestion. The congestion peaks between 5:15 p.m. and 5:30 p.m. when as many as 25 people wait in a 144-square-foot area. The sidewalk width in this area is about 14.5 feet, but the bus shelter reduces its effective width. In addition, the sidewalk is bordered by a temporary plywood wall that prevents waiting bus passengers from being able to step back from the sidewalk. The bus queue travels up Fremont Street and at times provides only about two feet of clearance for through pedestrians. This GGT stop is also not well-signed. There is a poorly painted curbline stop and a GGT decal on a traffic signal post. Another difficulty at this stop is a lack of curb space for buses to pull up at the same time.

The third GGT bus stop in the area is located along Fremont Street just north of Mission Street. This stop has the fewest pedestrian queuing problems. The sidewalk at the stop is no wider than the sidewalk at the stop south of Mission Street, but the adjacent building features an overhang, which creates an additional six to ten feet of pedestrian space and provides shelter for waiting passengers. Passengers have enough room to create an orderly line that allows room for through pedestrians.

At all three stops, the highest number of pedestrians waiting for buses occurs between 4:30 p.m. and 5:15 p.m. Figure 3.4-3, Pedestrian Activity Areas, summarizes the pedestrian conditions in the Transbay area. Most GGT buses and all Golden Gate ferries are equipped to transport bicycles.

| Figure 3.4-3 | Pedestrian Activity Areas |
|---|---|



### 3.4.1.4 Origin/Destination Analysis

It is important to understand the destination of pedestrians flowing out of the Transbay Terminal area to identify key pedestrian travel corridors. To gather this information, surveys were conducted around the Terminal. Passengers riding Golden Gate Transit, SamTrans and other transportation modes were intercepted outside the Transbay Terminal. In addition, surveys were distributed to waiting AC Transit passengers inside the Transbay Terminal. The surveys asked these Transbay Terminal area patrons about their destinations after leaving the terminal area and origins before coming to the terminal area. Valid surveys were collected from 2,570 Transbay Terminal patrons. About 690 surveys were collected from passengers outside the terminal and about 1,880 were collected from people inside the terminal.

The survey was conducted during evening commute hours and asked people about their travel patterns both when leaving the terminal in the morning and returning to the terminal area in the evening. Patrons were asked how they got to the Terminal area in the morning. The mode of travel to San Francisco of those surveyed is shown in Table 3.4-2.

**Table 3.4-2: Mode of Travel to San Francisco**

| Mode | Frequency | Percent |
|---|---|---|
| AC Transit | 1,078 | 41.95 |
| Carpool | 826 | 32.14 |
| Golden Gate Transit | 249 | 9.69 |
| MUNI bus | 159 | 6.19 |
| BART | 119 | 4.63 |
| SamTrans | 63 | 2.45 |
| Napa Valley Commute Club | 25 | 0.97 |
| Drove | 14 | 0.54 |
| Ferry | 9 | 0.35 |
| Bike Shuttle | 8 | 0.31 |
| MUNI light rail | 6 | 0.23 |
| Walked | 4 | 0.16 |
| Greyhound | 3 | 0.12 |
| Other/No Response | 3 | 0.12 |
| Bicycled | 2 | 0.08 |
| Caltrain | 1 | 0.04 |
| VTA | 1 | 0.04 |
| **Total** | **2,570** | **100** |

Source: Nelson\Nygaard, August 2001

Figure 3.4-4 shows the San Francisco destinations of the Transbay Terminal area patrons after leaving the terminal area in the morning.

Figure 3.4-4

## AM Destinations of Transbay Terminal Area Patrons

The majority (78 percent) of Transbay Terminal area patrons walk from the Terminal (or Terminal area) to their morning destinations. Just 1.7 percent (44 people) use BART to get to their destinations, 7.3 percent use Muni buses and 3.0 percent use the Muni Metro light rail. Table 3.4-3 shows how terminal patrons get to their morning destinations within San Francisco.

**Table 3.4-3: Mode of Travel from the Transbay Terminal to Morning San Francisco Destinations**

| Mode | Frequency | Percent |
|---|---|---|
| Walked | 2001 | 77.86 |
| MUNI bus | 188 | 7.32 |
| No Answer | 138 | 5.37 |
| MUNI light rail | 76 | 2.96 |
| BART | 44 | 1.71 |
| N/A-didn't come through area in morning [1] | 27 | 1.05 |
| Bicycle | 26 | 1.01 |
| Drove | 24 | 0.93 |
| Used a shuttle | 23 | 0.89 |
| Other | 15 | 0.58 |
| SamTrans/Golden Gate Bus | 5 | 0.19 |
| Caltrain | 3 | 0.12 |
| **Total** | **2570** | **100** |

**Notes:** [1] Since the survey was conducted in the PM, this choice was provided.

**Source:** Nelson\Nygaard, August 2001

According to Table 3.4-3 above, 1.71 percent of Transbay Terminal Area patrons used BART to get their final destinations in San Francisco after coming to the Transbay Terminal area in the morning. Table 3.4-4 below shows the mode that patrons transferred from before getting on BART to travel within the city.

About 27 percent (12 of 44) of those who said they used BART to get to their morning destinations in the city from the Terminal area were actually on BART for the whole trip[9]. Just 32 of the 2,543 patrons surveyed (1.3 percent) who came through the Transbay Terminal area in the morning transferred from another travel mode to BART.

[9] Because the survey was conducted in the evening, it was possible to have surveyed patrons in the terminal area who rode BART for their entire morning commute and did not actually come through the terminal area in the morning. Thus, these people did not transfer from another mode to BART.

**Table 3.4-4: Travel Mode of Survey Respondents Using BART To Get To San Francisco Destinations In the Morning**

| Mode | Number [1] | Percentage |
|---|---|---|
| AC Transit | 11 | 25.00% |
| BART | 12 | 27.27% |
| Carpool | 9 | 20.45% |
| MUNI bus | 3 | 6.82% |
| Golden Gate Transit | 9 | 20.45% |
| **Total** | **44** | **100%** |

**Notes:** [1] Terminal Area Patrons Using BART to get to their SF destination in the morning.
**Source:** Nelson\Nygaard, August 2001

### 3.4.2 BICYCLE CONDITIONS

#### 3.4.2.1 Bicycle Access

*Howard, Market, Folsom and Second Streets and the Embarcadero are designated as citywide bike routes serving the area. Howard, Folsom, and Embarcadero Street feature striped bike lanes while Market and Second Streets does not. The Howard Street bike lane runs on the north sides of the street between Fifth and Eleventh Streets but not within the area immediately around the Transbay Terminal. The San Francisco Department of Parking and Traffic is currently considering a proposal to extend the Howard Street bike lane eastward to Fremont Street and provide a new bike lane on Second Street.*

There are many obstacles to bicycle riding on Folsom, Howard, and Market Streets. The six-foot-wide bike lane on Folsom Street is not continuous throughout the study area. The bike lane stops and starts to allow for on-street parking and right-hand-turn lanes. Street parking on Howard Street forces bikes and cars to share a narrow lane along much of its length while stopped transit vehicles and traffic islands can impede both bicyclists and cars alike on Market Street. At the intersections of First and Howard Streets and Beale and Howard Streets, right-hand-turn lanes force bicycles to merge into traffic.

Public transit serving the area accommodates bicycles. Both BART and Caltrain allow bikes on trains. Caltrain has bike racks on certain cars, and each train is able to accommodate up to 24 bikes. Most of AC Transit's Transbay buses and most of SamTrans' buses are equipped with bicycle racks. The Transbay Terminal itself has eight bike lockers. The City of San Francisco's Department of Parking and Traffic purchased these lockers with a Clean Air Quality grant. The lockers are maintained with user fees. Lockers can be rented for six months or a year, for $45 and $75, respectively. All are currently rented and there is a waiting list.

Caltrans operates a bike shuttle between the MacArthur BART station in Oakland and the Transbay Terminal during morning and evening commute hours. Service consists of six morning and six evening trips. Four of the morning trips run east to west (Oakland to SF) and two run in the reverse commute direction (SF to Oakland). In the evening, four trips run from the Transbay Terminal (SF) to MacArthur BART (Oakland) and two run in the opposite direction. The fare is $1.00 each way. Each trip can accommodate up to 14 bicycles.

### 3.4.2.2 Bicycle Traffic Levels

While there is no standard for defining bicycle Levels of Service, bicycles counts were conducted to get a sense of the volume of bicycle traffic flowing through the study area. The counts were conducted at the five-named intersections between 4:00 p.m. and 7:00 p.m. The peak 15-minute bicycle counts for each intersection are shown in Table 3.4-5.

**Table 3.4-5: Peak 15-Minute Bicycle Traffic Volumes**

| Intersection | Street | Bikes Per Peak 15-Minutes |
|---|---|---|
| Mission & First | Mission | 2 |
| | First | 5 |
| Mission & Fremont | Mission | 3 |
| | Fremont | 2 |
| Howard & First | Howard | 11 |
| | First | 5 |
| Howard & Fremont | Howard | 9 |
| | Fremont | 2 |
| Folsom & Beale | Folsom | 3 |
| | Beale | 3 |

The highest volumes of bicycle traffic in the evening peak were observed on Howard Street. Overall, bicycle traffic is light at the intersections observed. Figure 3.4-5 shows the bicycle network in the study area.

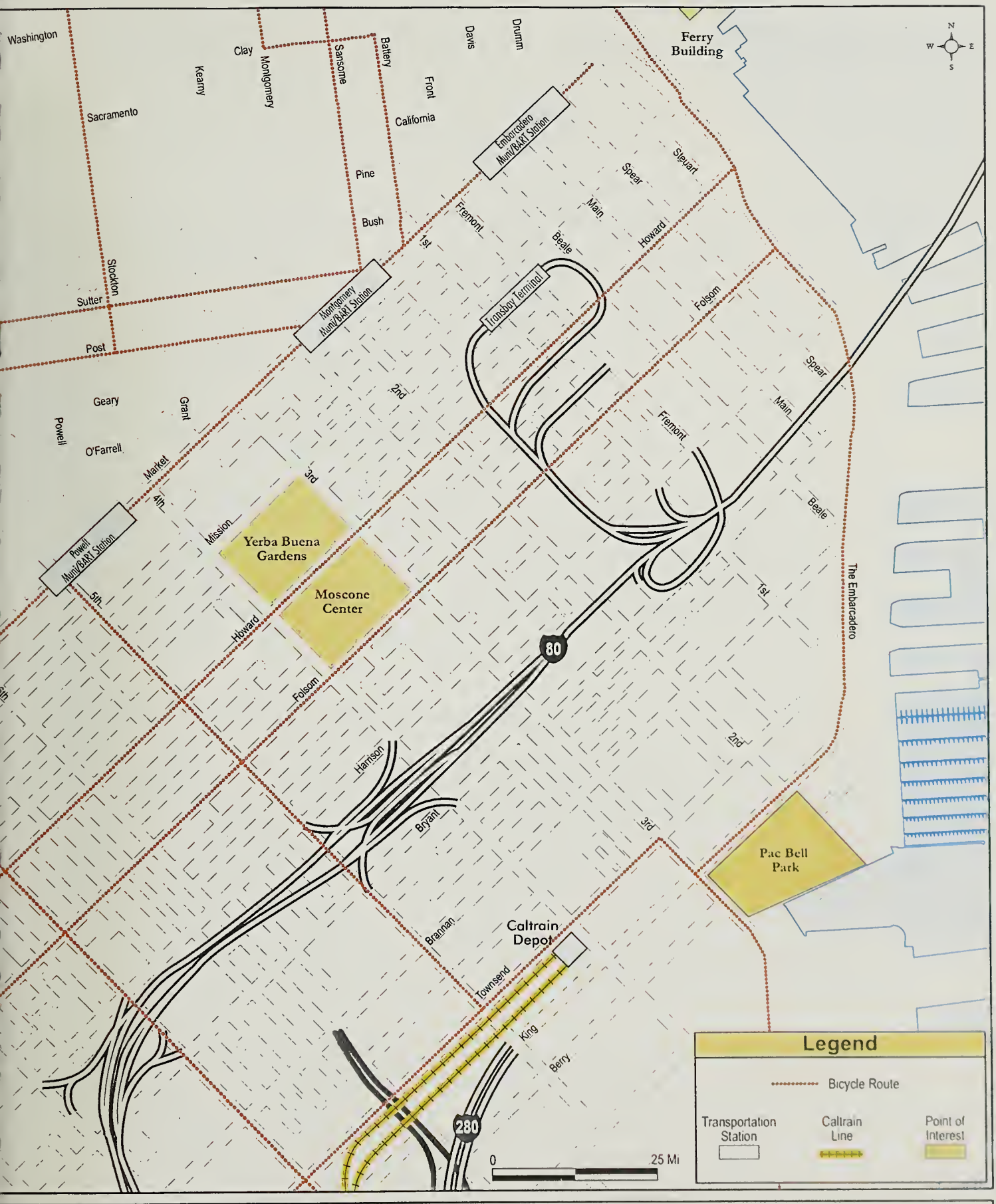



Figure 3.4-5 | Bicycle Routes in the Project Area

# CHAPTER 4: AFFECTED ENVIRONMENT

This chapter presents information on the environmental setting in the project area, organized by environmental issue category. The project study area encompasses the geographic area potentially most affected by the project. For most issues involving physical effects, this is the project footprint, or the area that would be disturbed for or replaced by new project facilities. This area includes the proposed downtown extension alignment from the existing Caltrain terminal and storage yard at Fourth and Townsend Streets to the Transbay Terminal, and it also includes the proposed redevelopment area surrounding the Transbay Terminal. Socioeconomic effects may be felt over a larger area.

## 4.1 LAND USE, WIND AND SHADOW

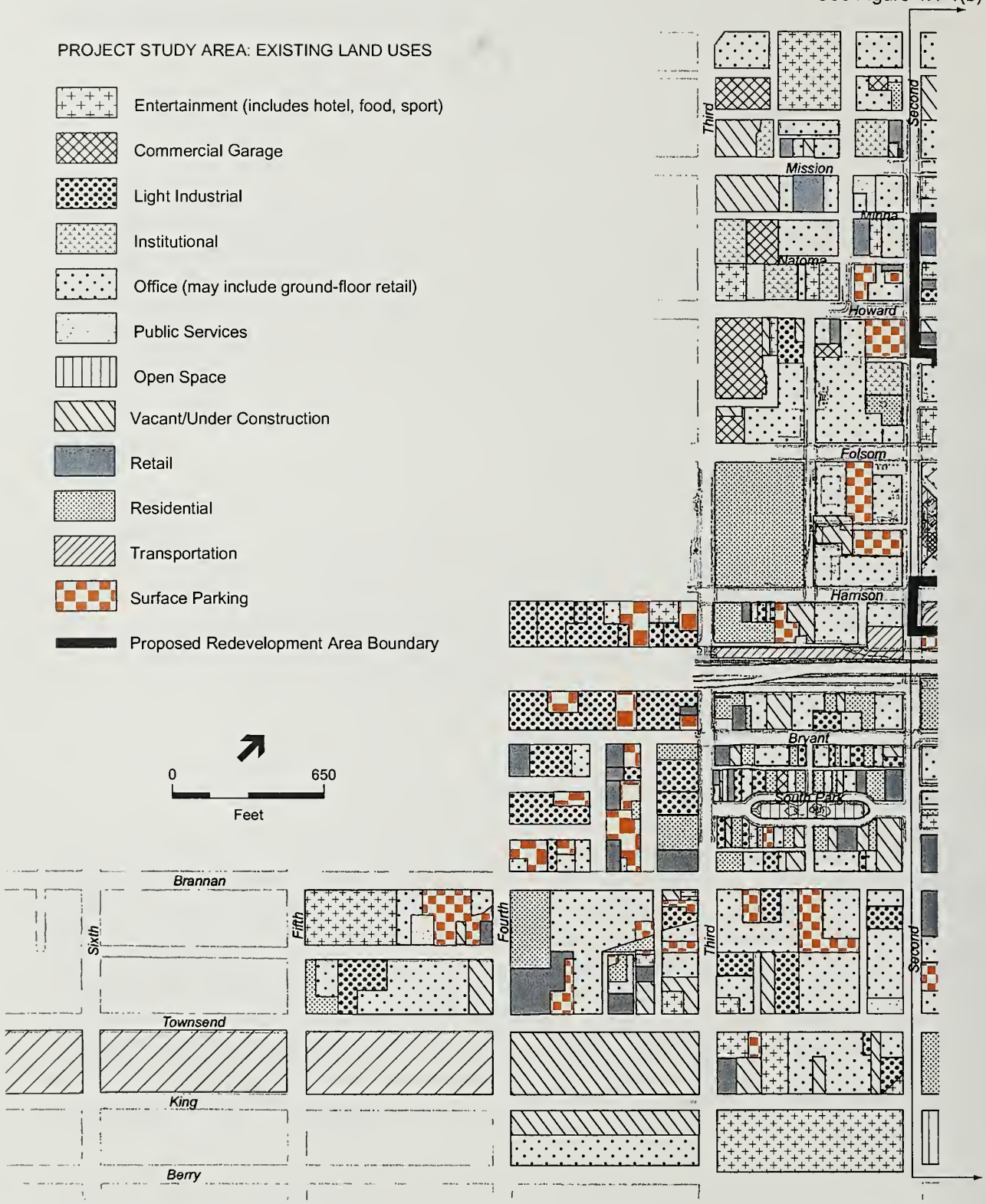
The land use study area, as shown on Figure 4.1-1, includes areas near the Caltrain Downtown Extension Alternative routes as well as the proposed Transbay Redevelopment Area. The study area is bounded by Third, Fourth and Seventh Streets to the west, China Basin to the south, The Embarcadero and Steuart and Spear Streets to the east, and Howard and Market Streets to the north. Boundaries of the proposed Transbay Redevelopment Area (shown on Figure 4.1-1) encompass the Transbay Terminal and its immediate environs, except for some areas immediately south of the Transbay Terminal.

### 4.1.1 EXISTING LAND USES IN THE PROJECT AREA

The proposed project area contains a mix of light industrial, warehousing/distribution, commercial office, retail, live-work, and residential uses and surface parking lots. Since the 1930s, the area has been dominated by regional transportation facilities associated with the Bay Bridge, including the Bridge structure and approaches, the Terminal Separator Structure (Bay Bridge ramps), the Transbay Terminal and ramp structures that connect to the Bridge, and the Embarcadero Freeway. Due to the 1989 Loma Prieta Earthquake and subsequent demolition of the Terminal Separator Structure and Embarcadero Freeway, there are now a number of remnant and/or irregularly-shaped parcels interspersed throughout the area, most of which are used for surface parking. These parcels are the focus of proposed rezoning from P (Public) to C-3-O (Downtown Office), or to C-3-O (SD) – Downtown Office Special Development and potential development sites.

Office use was the predominant land use within the proposed Transbay Redevelopment Area in 1997, occupying about 89 percent of the developed square footage, much of it in high-rise buildings. Industrial uses occupied about four percent of the floor area, with hotel, institutional, retail, and residential uses occupying just under two percent each. Development since 1997 has

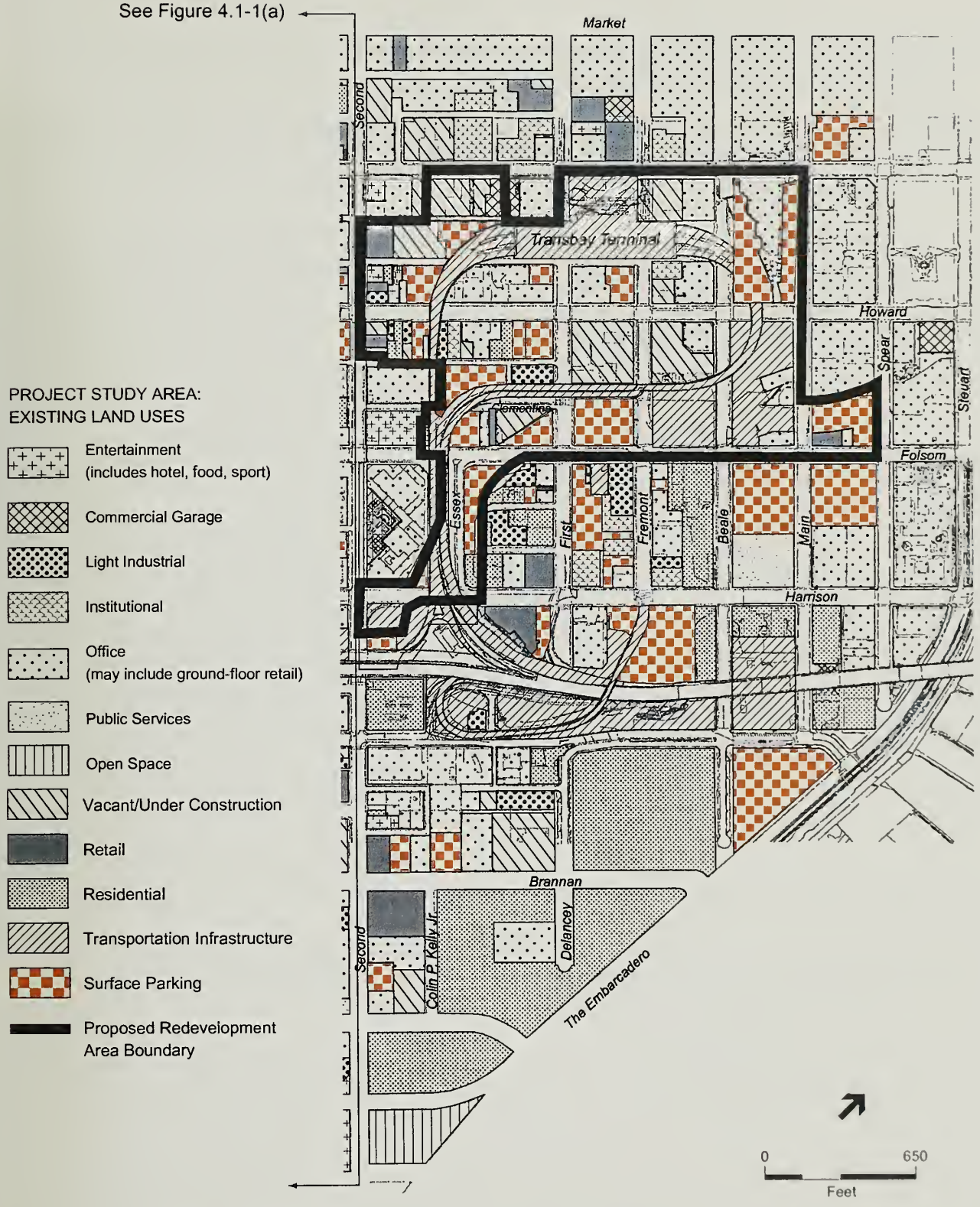
See Figure 4.1-1(b)




SOURCE: Parson's Transportation Group, Inc., Environmental Science Associates

*Transbay Terminal/Caltrain Downtown Extension / 201050* ■

**Figure 4.1-1(a)**
Existing Land Uses




SOURCE: Parson's Transportation Group, Inc., Environmental Science Associates

*Transbay Terminal/Caltrain Downtown Extension / 201050* ■

**Figure 4.1-1(b)**
Existing Land Uses

consisted primarily of high-rise office towers, with some high-rise residential development. The area contains limited publicly accessible open space. Since there are no public parks in the area, the existing open space generally consists of building setbacks and areas between office towers.

Major educational uses include Golden Gate University and the Academy of Art College, both located north and west of the Transbay Terminal. Remaining industrial sites and service uses, such as auto repair shops, are clustered within and near the Transbay Terminal ramps and along First and Fremont Streets south of Folsom Street. Surface parking lots are located along the north side of Folsom Street, beneath the terminal ramps, and at various other locations scattered throughout the area.

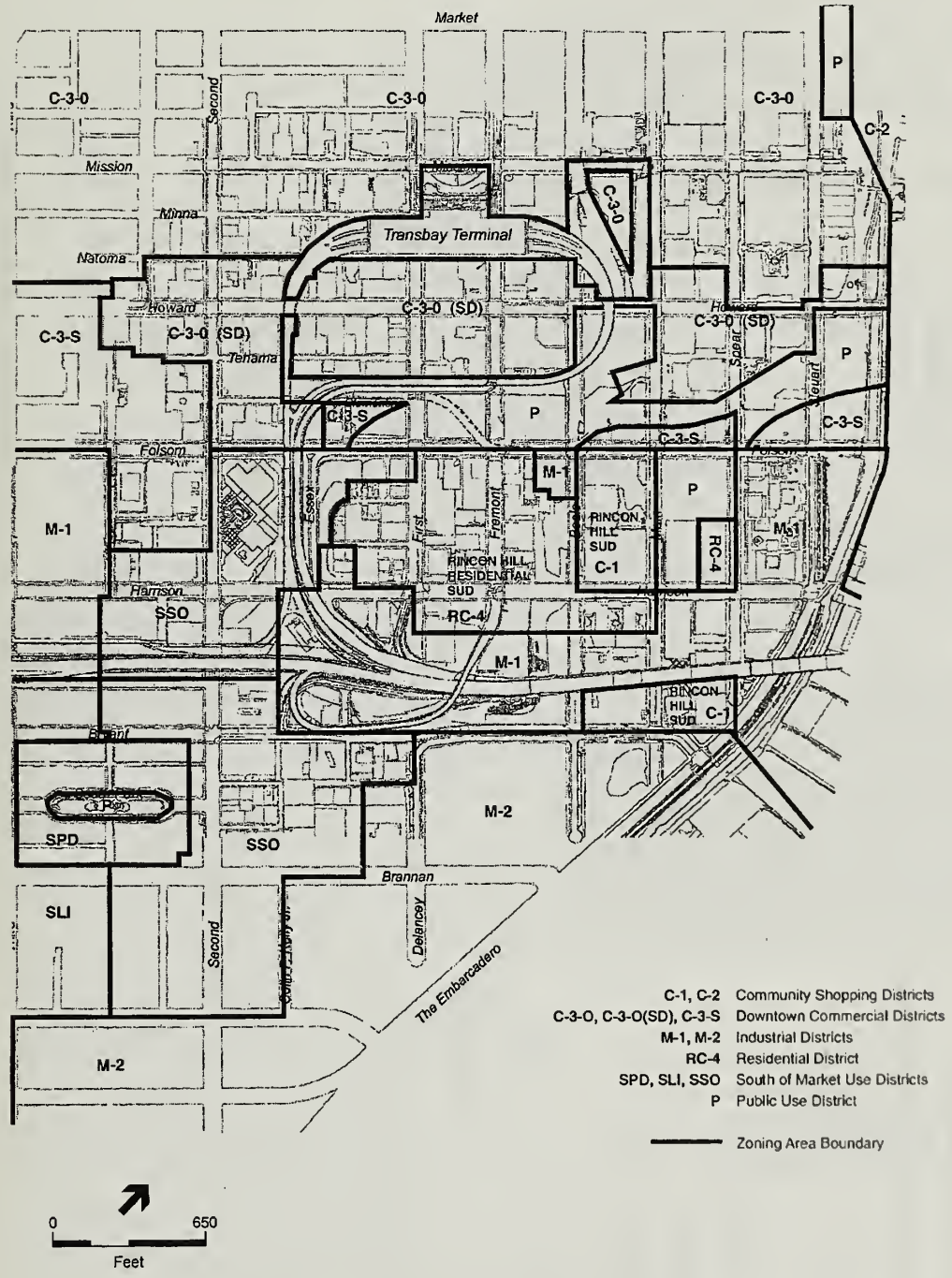
### 4.1.2 AREA PLANS AND ZONING

Existing plans and policies that affect not only the proposed project area, but also the larger land use study area, include the San Francisco General Plan and its elements, as well as area plans contained within the General Plan. The pertinent area plans include the Downtown Plan, the South of Market Plan, and the Rincon Hill Plan. Other area plans, such as the Northeastern Waterfront Plan, and San Francisco Redevelopment Agency Plans (including the Rincon Point-South Beach Redevelopment Plan, Yerba Buena Center Redevelopment Plan, and Mission Bay North Plan), guide land use in areas contained within the study area. A detailed listing of applicable plans and policies is included in the Technical Memorandum, Consistency with Existing Plans and Policies (ESA, 2001). Existing zoning is varied and reflects the multitude of different land uses found in the study area. Zoning districts in the area are described in Section 4.1.3 and shown on Figure 4.1-2.

### 4.1.3 NEIGHBORHOODS WITHIN AND ADJACENT TO THE STUDY AREA

This section provides a discussion of existing land uses, applicable plans and zoning regulations, and proposed development in each neighborhood within or adjacent to the study area. Figure 4.1-3 identifies neighborhood boundaries (land use subareas).

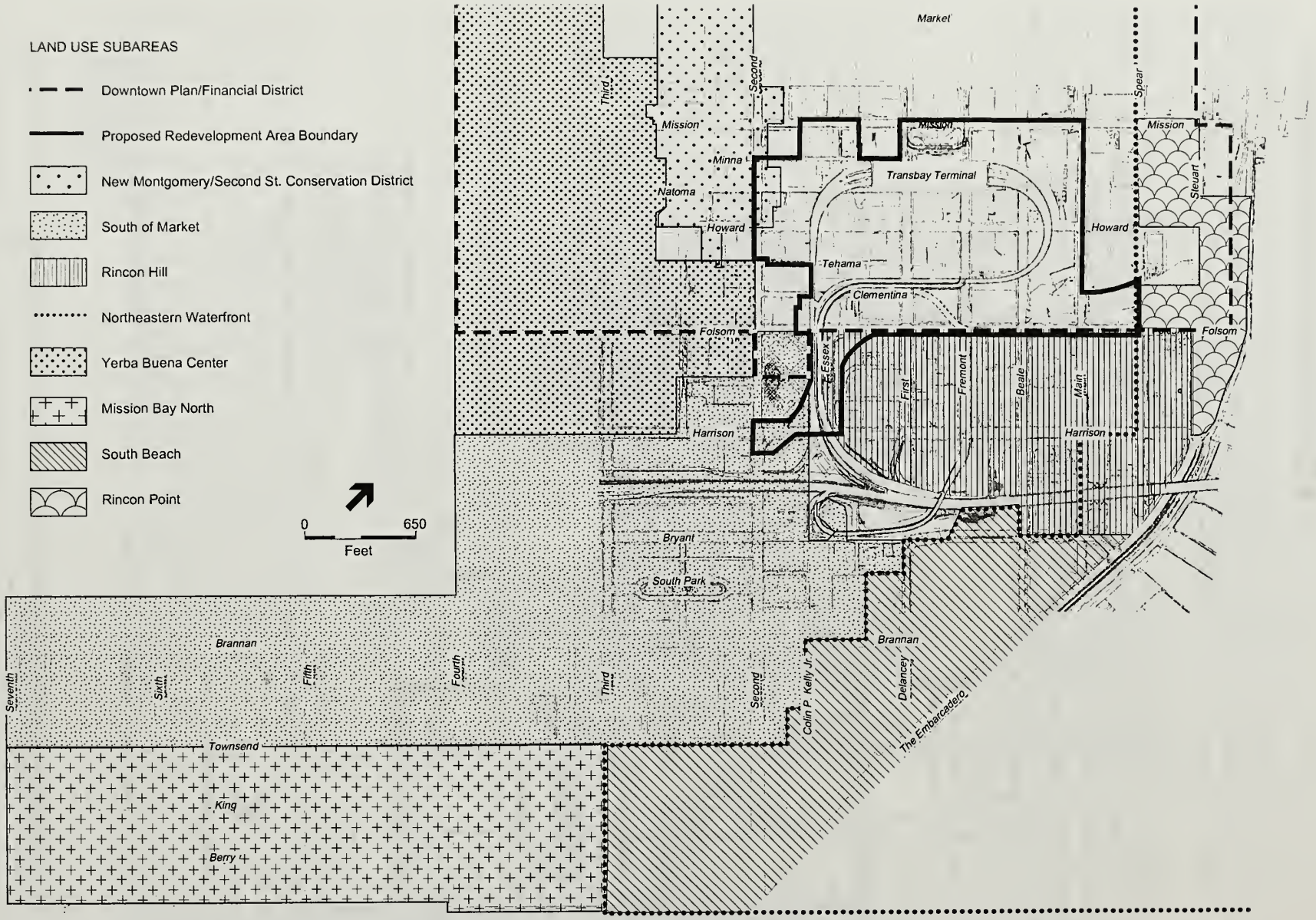
Height and bulk of new development is regulated by height and bulk districts established by the City of San Francisco in order to relate "the height of buildings to important attributes of the City pattern and to the height and character of existing development," and to relate the bulk of buildings to "the prevailing scale of development to avoid an overwhelming or dominating appearance in new construction." (Planning Code Section 251). Height and bulk restrictions are of particular concern in the proposed Transbay Redevelopment Area and are discussed in Section 4.1.3.2, Transbay Terminal Environs. Figure 4.1-4 shows existing height and bulk districts in the area.




SOURCE: Parson's Transportation Group, Inc., Environmental Science Associates

*Transbay Terminal/Caltrain Downtown Extension / 201050* ■

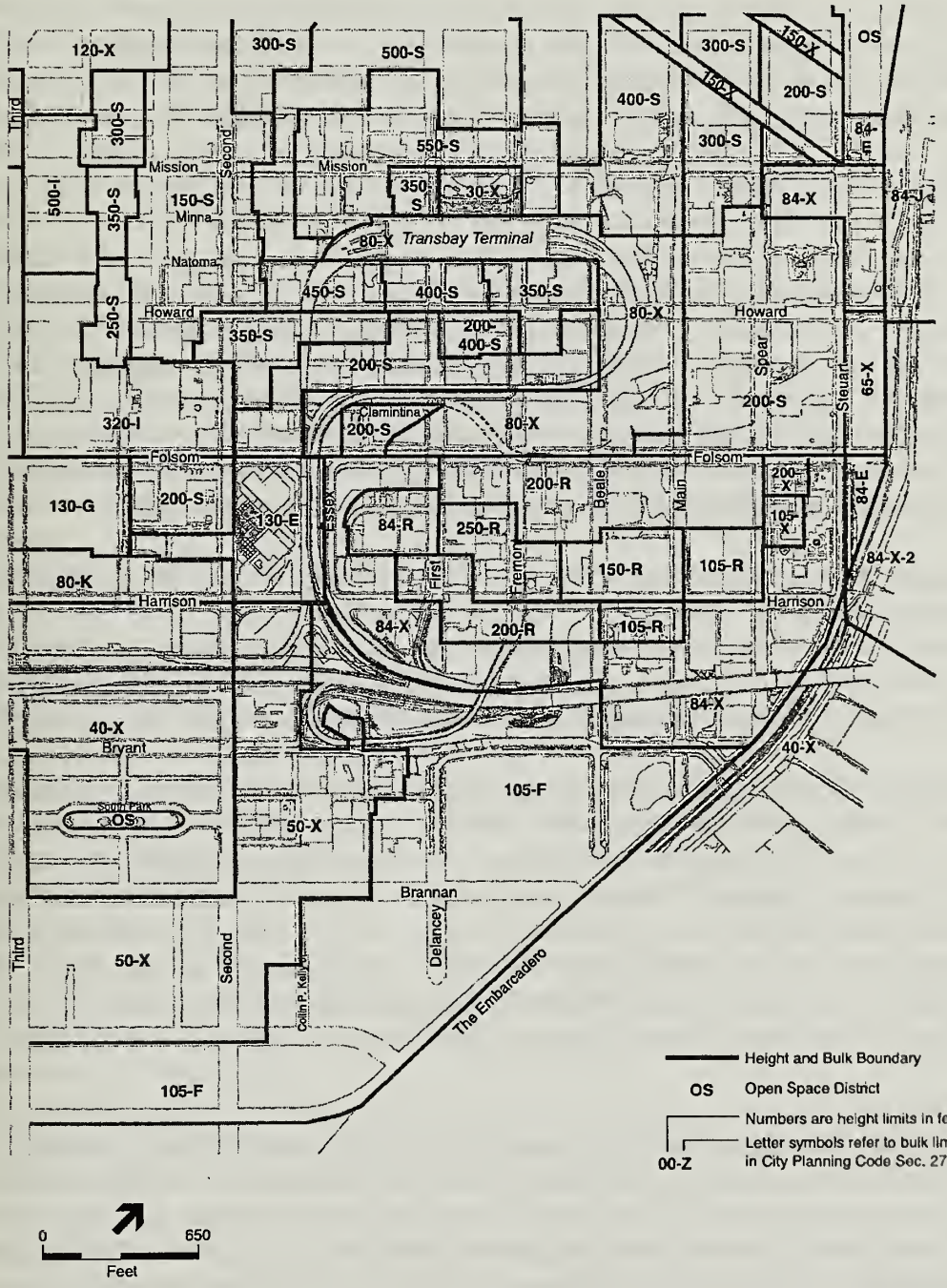
**Figure 4.1-2**
Existing Zoning




*Transbay Terminal/Caltrain Downtown Extension / 201050* ■

SOURCE: Parson's Transportation Group, Inc., Environmental Science Associates

**Figure 4.1-3**
Land Use Subareas




*Transbay Terminal/Caltrain Downtown Extension / 201050* ■

SOURCE: Parson's Transportation Group, Inc., Environmental Science Associates

**Figure 4.1-4**
Existing Height and Bulk Districts

### 4.1.3.1 Financial District

The Financial District, historically located north of Market Street, is composed of high-rise office buildings, most with ground floor retail. As described in the Downtown Plan (an Area Plan contained within the General Plan), the Financial District spills across Market Street south as far as Folsom Street. Along Spear and Main Streets, high-rise office buildings extend south nearly to Folsom Street. Thus, all of the project development north of Folsom Street *would* fall within the Downtown Plan's Financial District.

Between Market and Howard Streets, the Second Street corridor is characterized by historic office buildings of 100 feet or less in height with ground floor retail. These structures make up the New Montgomery/Second Street Conservation District of the Downtown Plan. Most of these are unreinforced masonry structures, several of which have been seismically upgraded, and are noted for architectural merit. Some older industrial buildings between Market and Folsom Streets have been converted to retail, office and residential uses. Warehouse buildings are being used for office buildings, factory outlets, live-work spaces, and media studios. Residential uses are located in converted commercial buildings and above the ground floor of commercial uses.

Recent development projects include new office buildings at 101 Second Street (at Mission Street), 199 Fremont Street (at Howard Street), One Second Street, and 631 Folsom Street. Another office building, the Gap headquarters, has been constructed immediately adjacent to the study area, at Folsom and Spear Streets. Recently completed residential (including live-work) projects include 370 Beale Street and a residential tower on Natoma Street near Second Street.

The Second Street corridor can be divided into two smaller subareas: contemporary offices and historic structures. The first subarea has several office buildings that were constructed in the 1970s and 1980s. These buildings, located between Folsom and Bryant Streets, have ground floor retail space and are typically 200 feet, or less, in height. Recently constructed buildings in the Second Street corridor include a 143-foot-tall office tower at 201 Second Street, the 180-foot Marriott Courtyard Hotel at 299 Second Street, the CNET building at 261 Second Street, and a residential mid-rise at 246 Second Street between Tehama and Clementina Streets. The second subarea, the New Montgomery-Second Street Conservation District, is described in Section 4.16.6.4.

A large portion of the Financial District is zoned C-3-O (Downtown Office), including the blocks south of Market Street, roughly to Minna Street. The C-3-O district is characterized by the intensity and compactness of its development, which permits face-to-face business contacts and offers the convenience of traveling by foot. Just south of this area is the C-3-O (SD) zoning district – Downtown Office Special Development – which is an area created to direct unused development potential, such as the transfer of development rights, near the downtown core. The C-S-3 District, which is located west of the study area near Third Street, accommodates functions such as wholesaling, printing, business services, and parking. This district has for the most part been underdeveloped.

Recently approved development in the Financial District includes the following:

- An office development at 524 Howard Street, approved in early 1999;
- The Foundry Square project, an office development consisting of four separate office structures at the intersection of First and Howard Streets, currently under construction;
- An addition of 60,000 square feet of office space to an existing office building at One Market Street;
- A 700,000 square foot office development at 554 Mission Street;
- A 24-story, 253,000-square foot office development with ground-floor retail at 535 Mission Street;
- Demolition of existing four-story warehouse building and construction of a seven-story office building at 235 Second Street;
- A 40,000-square foot office building at 272 Main Street;
- A 579,034-square foot office building at 555-569 Mission Street;
- Vertical addition of mezzanine and fourth story to an existing three-story building providing office and light industrial uses at 38-44 Tehama Street;
- A seven-story building to house mechanical, electrical, and data equipment at 57 Jessie Street;
- A 20-story, 200-foot tall mixed-use (commercial and residential) building at 48 Tehama Street;
- A 10-story, 45,800 square foot office building with ground-floor retail on the site of an existing surface parking lot at 201 Second Street;
- Construction of a seven-story, 95-foot tall office building with 24,435 square feet of office use at 69 Clementina Street;
- A two-story vertical addition to an existing three-story office building at 55 Natoma Street;
- A 10-story office building with ground-floor retail at 35 Hawthorne Street;
- 33 new live work or condominium units at 530-534 Folsom Street;
- 24 residential and eight live/work units on a vacant lot currently used for parking at 19 Clementina Street;
- 185 residential units in a 16-story-over-basement, 150-foot tall building on a lot currently used for surface parking at 199 New Montgomery Street;
- An eight-level, primarily short-term parking garage with 425 spaces at the San Francisco Museum of Modern Art;
- Three-story vertical addition to an existing nine-story parking garage at 51 Third Street;
- A 200-room hotel with ground-floor retail space at Mission and Steuart Streets;
- Improvements to the Embarcadero Music Concourse.
- *A 605-foot high-rise on the south side of Mission Street between Fremont and Beale Streets. 301 Mission Street was approved for development by the San Francisco Planning Commission on July 31, 2003. As approved, the 301 Mission Street project has been modified to be more compatible with the Second-to-Main alignment, which was selected as the Caltrain Extension Component of the Locally Preferred Alternative in March 2003.*

### 4.1.3.2 Transbay Terminal Environs

The existing Transbay Terminal is located in the Financial District and is bounded by Mission Street to the north, First Street (and slightly beyond toward Second Street) to the west, Natoma Street to the south, and Fremont Street to the east, with bus ramps that form an elevated loop connecting to the Bay Bridge to the south. The Transbay Terminal site is zoned for Public Use. The blocks encircled by the existing terminal and ramps currently are less intensely developed than other portions of the study area north of Clementina Street; however, recent project approvals by the Planning Commission would change the area. Industrial and service uses are generally located in one- to six-story buildings that front the alleys of Natoma, Tehama and Clementina Streets. Some of these buildings have been converted to office and some to residential use. Although buildings in the Terminal environs are typically less than six stories, the area includes four high-rise office buildings located at 100 First Street, 201 Mission Street, 301 Howard Street, and 199 Fremont Street. The latter two are the only high-rises inside the Terminal loop ramps, while others have been approved at 524 Howard Street, 545 Mission Street, 555 Mission Street, 575 Mission Street, and Foundry Square at First and Howard Streets. *The* 605-foot high-rise on the south side of Mission Street between Fremont and Beale Streets *has been approved for development by the San Francisco Planning Commission.* This area also has a noticeable amount of vacant land. Between Howard and Folsom Streets, there are a number of surface parking lots on remnant and/or irregularly shaped parcels that became vacant after the 1989 earthquake and subsequent demolition of the Terminal Separator Structure.

The proposed Transbay Redevelopment Area contains various height and bulk districts. The lowest building heights are established by the 30-X district located at the corner of First and Mission Streets; the tallest building heights have been established in a 400-S district on Assessor's Block 3718. The tallest buildings in the Transbay Terminal environs are in a 550-S district between First and Second Streets on Mission Street, which is outside the proposed Transbay Redevelopment Area. Figure 4.1-4 and Table 4.1-1 identify the existing zoning and height and bulk districts for the proposed Transbay Redevelopment Area.

### 4.1.3.3 Rincon Hill

Rincon Hill, bounded by Essex and Folsom Streets, The Embarcadero, the Bay Bridge, and portions of Bryant Street, contains 55 acres of land, subdivided into over 70 parcels. Rincon Hill borders the proposed Transbay Redevelopment Area on the south along Folsom Street. Buildings in the area are typically less than four stories high. Rincon Hill was San Francisco's first well-to-do residential neighborhood, but it has been a warehouse and distribution area since the latter third of the 19th Century. Industrial and commercial buildings dominate the area, although there are also residential uses. Vacant or underutilized parcels are interspersed throughout Rincon Hill. Within the last decade, encouraged by the Rincon Hill Plan, there has been an increase in the construction of residential space. New residential projects have been constructed at 388 Beale Street (Avalon Towers), 403 Main (Portside Condominiums) and live-work projects along Folsom Street and First Street and Guy Place.

The San Francisco Planning Code established a special use district for Rincon Hill to protect the existing environment and to further the goals and policies contained in the Rincon Hill Plan. The intent is to convert an outmoded industrial area to a unique mixed-use neighborhood close to downtown.

**Table 4.1-1: Existing Zoning in the Proposed Transbay Redevelopment Area**

| Assessor's Block | Block Bounded by | Zoning Districts | Height/Bulk Districts |
|---|---|---|---|
| 3718 | Mission, Main, Howard, and Beale Streets | P, C-3-0, C-3-0 (SD) | 80-X, 80X / 400S |
| 3720 | Mission, Fremont, Howard, and First Streets | P | 30-X / 80-X |
| 3736 | Howard, First, Folsom, and Second Streets | P | 80-X / 200-S |
| 3737 | Howard, Fremont, Folsom, and First Streets | P, C-3-0 (SD) | 80-X |
| 3738 | Howard, Beale, Folsom, and Fremont Streets | P | 80-X |
| 3739 | Howard, Main, Folsom, and Beale Streets | P, C-3-0, C-3-0 (SD), C-3-S | 80-X, 90-X, 200-S |
| 3740 | Howard, Spear, Folsom, and Main Streets | P, C-3-S | 40-X, 200-S |
| 3749 | Folsom, First, Harrison, and Second Streets | M-1 | 84-X |
| 3764 | Harrison, Rincon, Bryant, and Second Streets | P | 50-X |

Zoning Districts:
C-3-0: Downtown commercial office
C-3-0 (SD): Downtown commercial office (special development)
C-3-S: Downtown support
M-1: Light industrial
P: Public use
S: See Planning Code Section 270(d) or refer to Height and Bulk maps 1H, 2H and 7H of the Zoning Map.

**Source:** San Francisco Planning Department and Heller Manus Architects, June 2001

### 4.1.3.4 South of Market

The South of Market Area (SOMA) is generally bounded by Mission Street to the north, Townsend Street to the south, South Van Ness Avenue to the west and Second Street to the east. SOMA borders on the proposed Transbay Redevelopment Area to the east at Second Street, but does not overlap it. It was originally established as a well-to-do neighborhood during the mid-1850s, but was completely destroyed by the earthquake and fire of 1906. SOMA was subsequently rebuilt as a warehouse and working-class residential district. SOMA is now dominated by light industrial manufacturing and office uses, although pockets of post-1906 earthquake housing exist and substantial amounts of residential development – mainly in the form of live-work lofts – have been constructed within recent years. There are also cultural uses, generally clustered around the Yerba Buena Center, and entertainment uses along Folsom and Eleventh Streets.

Zoning in SOMA is characterized by service and light industrial land uses. The SSO (Service Secondary Office) and SLI (Service Light Industry) zoning districts are located south of the C-3-S district, extending to Townsend Street. Residential Enclave Districts (RED) encompass

the clusters of low-scale, medium density, predominantly residential neighborhoods located along the narrow side streets of the South of Market SLR district. Within these predominantly residential enclaves lie a number of vacant parcels, parking lots and other properties in open storage use.

#### 4.1.3.5 Yerba Buena Center

Yerba Buena Center is an 87-acre redevelopment area within the SOMA District that extends from Market Street on the north to Harrison Street on the south, and from Second Street on the east to the west along Fourth Street. The boundaries of the Yerba Buena Center lie to the west of the proposed Transbay Redevelopment Area, and their boundaries do not overlap. Uses within the Yerba Buena Center include the San Francisco Museum of Modern Art, the Moscone Convention Center, and the Sony Metreon, as well as gardens, retail, recreation, amusement, entertainment, parking, and a substantial amount of housing.

#### 4.1.3.6 South Park

South Park is a mixed-use neighborhood bounded by Bryant Street to the north, Brannan Street to the south, Third Street to the west, and Second Street to the east. South Park is within the SOMA Area Plan, but would not be part of the Transbay Redevelopment Area. South Park was San Francisco's first master-planned upscale residential neighborhood, but it was completely destroyed in the earthquake and fire of 1906. Rebuilt to generally reflect what existed prior to the earthquake, it is now a mixed-use neighborhood surrounding a grassy open space. Office and commercial uses are prevalent, and residential uses are interspersed throughout. Zoning controls in South Park are guided by Planning Code Section 814, intended to "preserve the scale, density and mix of commercial and residential activities within this unique neighborhood."

#### 4.1.3.7 Northeastern Waterfront

The Northeastern Waterfront Planning Area is south and east of the proposed Transbay Redevelopment Area and extends from Aquatic Park to China Basin. This planning area contains four subareas, two of which – the Ferry Building Subarea and the South Beach Subarea – are directly adjacent to the study area for the present project. The Ferry Building Subarea surrounds the Ferry Building and contains a newly constructed open space plaza directly in front of the Ferry Building. The Ferry Building Subarea is linked to the South Beach Subarea by the waterfront promenade along The Embarcadero. Since the 1980s, the South Beach Subarea has been transforming into a new residential and commercial mixed-use neighborhood, which still retains some of its industrial and maritime flavor. The extension of the N-Judah Muni-Metro light rail line from Embarcadero Station provides a direct link to the downtown area. New mid-rise residential structures and a 45,000-seat baseball park (Pacific Bell Park) were recently constructed. This area contains a considerable amount of land zoned for manufacturing uses.

#### 4.1.3.8 Mission Bay North

Mission Bay, under the jurisdiction of the San Francisco Redevelopment Agency, is divided into two redevelopment project areas: Mission Bay North and South. Mission Bay North borders on the study area and is bounded by Third Street, Townsend Street, Mission Creek, and Seventh Street. This area contains a portion of the Caltrain yard, as well as land uses that are in transition from their historical transportation and industrial functions. Construction of residential units, office space, retail, and public open space has begun in this area. The San Francisco Redevelopment Agency established land use controls regulating development of blocks encompassing and surrounding the Caltrain rail yard. The blocks that contain the Caltrain terminus and related spur alignments have been zoned MB-O, in order to be developed with large floor plan and smaller structures for office uses.

### 4.1.4 Existing Wind Conditions

Wind tunnel testing was performed to characterize existing wind conditions throughout the proposed redevelopment area and to provide a baseline for comparison with wind conditions that would result from potential development. The tests used the methodology of Planning Code Section 148. The results of the wind tunnel test, as documented in the Wind Test Technical Memorandum, are summarized in Section 5.1.2. Existing wind speeds were measured at sixty-one locations within the Transbay Redevelopment Area, where speeds are moderate to windy. Wind speeds, expressed as speeds that are exceeded 10 percent of the time, range from three mph to 11 mph; the average of these wind speeds is 5.5 miles per hour (mph). The highest wind speed of 11 mph occurs on the south side of Harrison Street at Second Street. All 61 points tested meet the Planning Code's pedestrian-comfort criterion value of 11 mph. The Planning Code's wind hazard criterion is currently not exceeded at any of the tested locations. A description of conditions in the four wind test subareas within the proposed Transbay Redevelopment Area is provided below.

- **Adjacent to or near the Transbay Terminal Building.** Existing wind speeds are low, ranging from four to seven miles per hour.
- **Area bounded by Mission, Main, Folsom, and Beale Streets.** Existing wind speeds in this area are also low, ranging from three to six miles per hour.
- **Adjacent to Folsom Street.** Existing wind speeds are moderate to windy, ranging from three to ten miles per hour.
- **Adjacent to or near Essex Street.** Existing wind speeds are moderate to windy, ranging from five to 11 miles per hour.

### 4.1.5 SHADOW

The City of San Francisco Planning Code Section 295 generally prohibits new buildings that would cause substantial new shadow on open space under the jurisdiction of the San Francisco Recreation and Park Commission between one hour after sunrise and one hour before sunset, at any time of the year. Sections 146 and 147 of the Planning Code protect sunlight access to streets and sidewalks and provide for reduction of shadows on public and publicly accessible open spaces within the C-3 districts (the largest section of the plan area). The project would have an adverse impact if it would result in substantial new shadow on public open space under the jurisdiction of the Recreation and Park Commission during these hours.

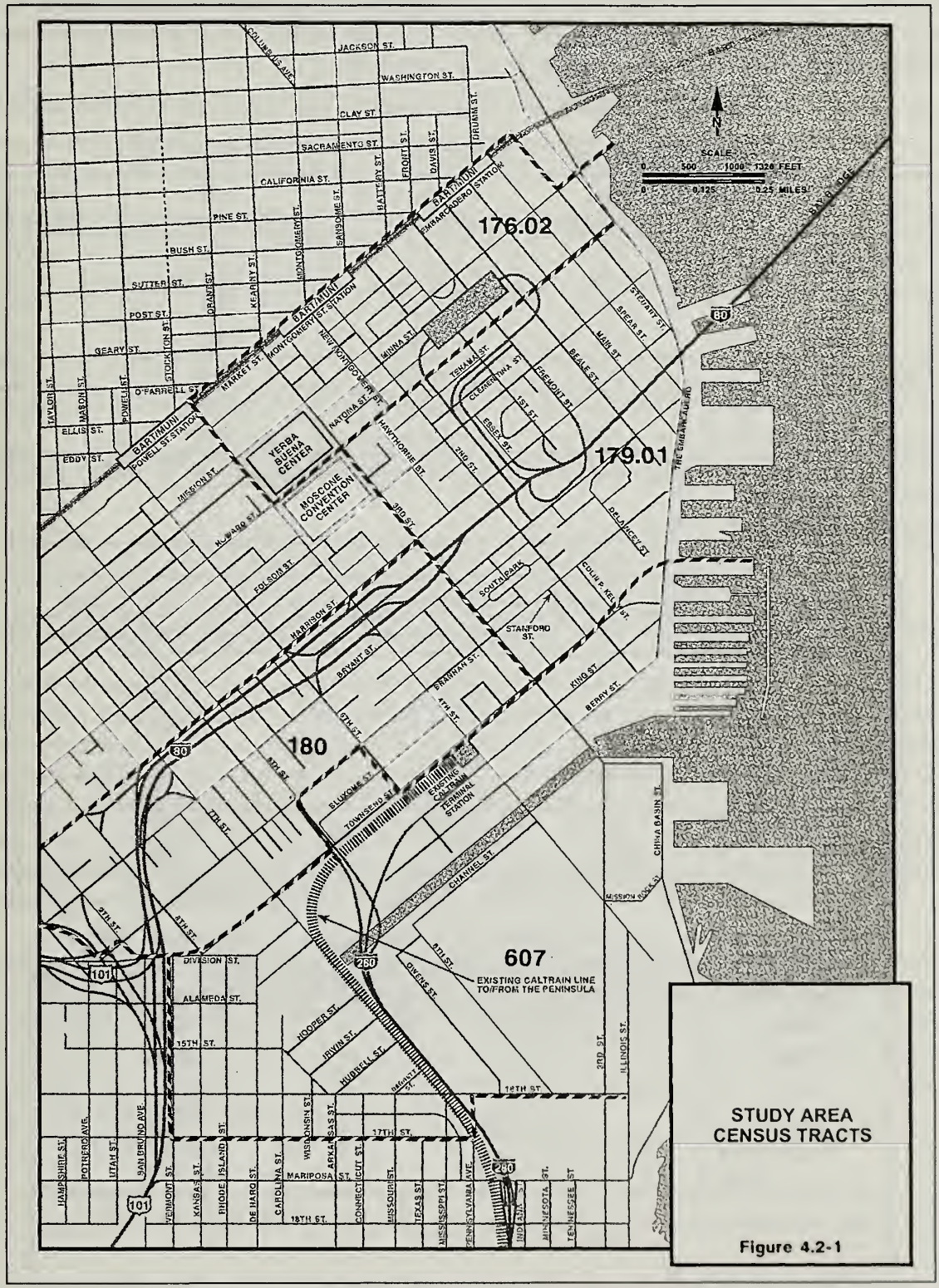
## 4.2 SOCIOECONOMIC CHARACTERISTICS

Study area socioeconomic character is described in terms of population, employment, housing, income, age, education, and racial composition. The area is experiencing rapid changes in population, housing, and local business activity. Data from the U.S. Census 2000 will be released over the next two years and will be incorporated into this document as it becomes available. Information from the 1990 census has been updated using Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC) data.

The project area is included within four census tracts covering the area from south of Market Street to Sixteenth and Seventeenth Streets and from the Bay to Vermont and Eleventh Streets. These tracts are shown in Figure 4.2-1. Each tract consists of two TAZs (MTC Traffic Analysis Zones) except for Tract 607, which includes three TAZs. All information presented herein is at the tract level; the more detailed TAZ data were analyzed when drawing conclusions about the spatial distribution of activity. Tract 607 includes the Fourth and Townsend station. The Caltrain Downtown Extension component would traverse Tract 179.01 and a portion of Tract 176.02 where the Transbay Terminal is located. The tail track would be located in Tract 179.01.

The U.S. Census 2000 estimated the study area total population to be 8,903, with a household population of 6,588 in 4,243 households. This represents a substantial growth over the 1990 population of 4,250 and 1,825 households. As shown in Table 4.2-1, the area now includes about 1.15 percent of the total estimated San Francisco population of 776,733, while in 1990, the area represented 0.6 percent of the population of 723,960. Household growth has been slightly greater than population growth. Housing is almost entirely multi-family, with 98 percent of all residential units containing two or more dwelling units. Household size in the area is about 1.6 persons, smaller than the 2.3 person average for the city as a whole.

As shown in Table 4.2-2, the area provided an estimated 132,714 jobs in 2000, representing about 21 percent of total city employment. Census Tract 176.02 contains just under 55 percent of the jobs in the study area.


176.02
179.01
180
607
EXISTING CALTRAIN LINE TO/FROM THE PENINSULA
STUDY AREA
CENSUS TRACTS
Figure 4.2-1

The median income of area households in 1989 ranged from approximately $21,000 (Tract 180) to $41,500 (Tract 179.01). The percentage of residents below the federal poverty level was 12.4 in 1990, approximately the citywide average (see Table 4.2-3).

**Table 4.2-1: Project Area Population and Households in 2000**

| Census Tract | Total Population | Population in Households[1] | Total Households | Persons per Household |
|---|---|---|---|---|
| 176.02 | 534 | 342 | 257 | 1.3 |
| 179.01 | 5,408 | 4,792 | 3,249 | 1.5 |
| 180 | 2,285 | 914 | 494 | 1.9 |
| 607 | 676 | 540 | 243 | 2.2 |
| **Project Area Total:** | **8,903** | **6,588** | **4,243** | **1.6** |
| **San Francisco:** | **776,733** | **756,976** | **329,700** | **2.3** |
| Project Area as % of City: | 1.15% | .87% | 1.28% | |

1 The discrepancy between total population and population in households is due to the number of individuals living in group quarters.

**Source:** U.S. Census 2000

**Table 4.2-2: Project Area Jobs and Employment Status of Residents in 2000**

| Census Tract | Project Area Jobs | Employed Residents |
|---|---|---|
| 176.02 | 72,645 | 2,543 |
| 179.01 | 32,594 | 4,783 |
| 180 | 18,018 | 1,031 |
| 607 | 9,457 | 926 |
| **Project Area Total:** | **132,714** | **9,283** |
| **San Francisco:** | **634,430** | **444,851** |
| Project Area as % of City: | 20.92% | 2.09% |

**Source:** San Francisco Planning Department, 2000; U.S. Census 2000; U.S. Census 1990

**Table 4.2-3: Project Area Household Income and Poverty Status in 1989**

| Census Tract | Median Household Income ($1989) | Percent Below Poverty Level |
|---|---|---|
| 176.02 | $35,125 | 7.9% |
| 179.01 | $41,465 | 8.9% |
| 180 | $20,724 | 31.2% |
| 607 | $37,000 | 0.0% |
| **Project Area Total** | **$20,724 - $37,000** | **12.4%** |

**Note:** Information will be updated once the U.S. Census 2000 data regarding income levels becomes available.

**Source:** U.S. Census 1990

Auto ownership within the study area is slightly less than for the city as a whole (0.7 autos per household compared with 1.3 citywide; see Table 4.2-4). This likely reflects the small household size and center-city location of the study area, but it points to a potential for high transit usage, similar to or even greater than that of San Francisco residents generally.

**Table 4.2-4: Auto Availability of Project Area Households in 2000**

| Census Tract | Average Autos per Household | "0" Auto Households | % | "1" Auto Households | % | "2" or More Auto Households | % | Total Households | % |
|---|---|---|---|---|---|---|---|---|---|
| 176.02 | 0.6 | 215 | 28.3 | 296 | 13.9 | 16 | 1.8 | 1,952 | 100 |
| 179.01 | 0.9 | 260 | 34.2 | 1302 | 61 | 734 | 80.3 | 3,596 | 100 |
| 180 | 0.6 | 275 | 36.2 | 215 | 10.1 | 215 | 23.5 | 1,121 | 100 |
| 607 | 0.9 | 10 | 1.32 | 71 | 3.3 | 31 | 3.4 | 1,019 | 100 |
| **Project Area Total** | **0.7** | **760** | **20** | **2,135** | **56.1** | **914** | **24** | **7,688** | **100** |
| **San Francisco:** | **1.2** | **88,827** | **28.2** | **127,474** | **40.4** | **99,288** | **31.5** | **315,546** | **100** |
| Project Area as % of City: | | 0.86% | | 1.67% | | 0.92% | | 2.44% | |

**Note**: Estimate prepared as part of demographic database for regional transportation modeling process.

**Source**: Metropolitan Transportation Commission, Forecasts for Regional Transportation Plan, 2000.

In 2000, the median age of study area residents ranged from 34 (Tract 180) to 37 (Tracts 607 and 176.02), below the city median of 37 years. The percentages of the very young (less than 16 years) and elderly (62 years or older) were both below the city averages, reflecting the working-age population of the study area (see Table 4.2-5). Over 87 percent of study area residents were high school graduates and 38 percent were college graduates, while the percentages for San Francisco are 78 percent and 35 percent, respectively. Similar to income and employment, educational attainment is highest in the eastern portion of the study area, where about 50 percent of the residents have at least one college degree.

Approximately 67 percent of area residents are white/Caucasian, which includes individuals of Hispanic origin. This is higher than the citywide average of about 54 percent. On the other hand, over 20 percent of study area residents are Black/African American, compared with 11 percent citywide. Approximately 34 percent of all area residents were members of minority groups, which may also include Hispanics, compared with about 46 percent citywide. The racial make-up of the study area is shown in Table 4.2-6.

**Table 4.2-5: Age and Education of Project Area Residents in 2000**

| Census Tract | Median Age | Population by Age Group | | | | | | Educational Attainment[1] | |
|---|---|---|---|---|---|---|---|---|---|
| | | Under 16 | % | 16-61 | % | 62 & Over | % | % H.S. Grad. | % Col. Grad. |
| 176.02 | 37.3 | 10 | 1.9 | 506 | 94.8 | 18 | 3.4 | 90.0 | 60.0 |
| 179.01 | 35.0 | 177 | 3.3 | 4,985 | 92.2 | 246 | 4.5 | 94.8 | 47.8 |
| 180 | 34.0 | 84 | 3.7 | 2,128 | 93.1 | 73 | 3.2 | 71.1 | 13.3 |
| 607 | 36.7 | 62 | 9.2 | 521 | 77.0 | 93 | 13.8 | 100.0 | 33.7 |
| **Project Area Total** | **34.0 – 37.3** | **333** | **3.7** | **8,140** | **91.4** | **430** | **4.8** | **87.3** | **37.7** |
| **San Francisco:** | **36.5** | **100,150** | **12.9** | **552,889** | **71.2** | **123,694** | **15.9** | **78.0** | **35.0** |
| Project Area as % of City | | 0.33% | | 1.47% | | 0.35% | | | |

[1] Information will be updated once the U.S. Census 2000 data regarding education levels becomes available.

**Source:** U.S. Census 2000; U.S. Census 1990

**Table 4.2-6: Race of Persons in Project Area in 2000**

| Census Tract | Total Population | | White | | Black/African Amer. | |
|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % |
| 176.02 | 534 | 100 | 321 | 60.1 | 87 | 16.3 |
| 179.01 | 5,408 | 100 | 3,640 | 67.3 | 448 | 8.3 |
| 180 | 2,285 | 100 | 1,046 | 45.8 | 670 | 29.3 |
| 607 | 676 | 100 | 381 | 56.4 | 72 | 10.7 |
| **Project Area Total:** | **8,903** | **100** | **5,388** | **60.5** | **871** | **9.78** |
| **San Francisco:** | **776,733** | **100** | **385,728** | **49.7%** | **60,515** | **7.8** |
| Project Area as % of City: | 1.14% | | 1.4% | | .112% | |

| Census Tract | Amer.Indian/ Alaska Native | | Asian/Pac. Islander | | Other | | Hispanic Origin* | |
|---|---|---|---|---|---|---|---|---|
| | Number | % | Number | % | Number | % | Number | % |
| 176.02 | 2 | 0.3 | 82 | 15.4 | 42 | 7.9 | 56 | 10.5 |
| 179.01 | 20 | 0.4 | 897 | 16.6 | 403 | 7.5 | 353 | 6.5 |
| 180 | 27 | 1.2 | 256 | 11.2 | 286 | 12.5 | 421 | 18.4 |
| 607 | 8 | 1.9 | 164 | 24.3 | 51 | 7.5 | 47 | 7.0 |
| **Project Area Total:** | **57** | **0.6** | **1,399** | **15.7** | **782** | **8.8** | **877** | **9.9** |
| **San Francisco:** | **3,458** | **0.45** | **243,409** | **31.3** | **83,623** | **10.8** | **109,504** | **14.1** |
| Project Area as % of City: | 0.07% | | 0.18% | | .101% | | .113% | |

* Included in other racial categories

**Source:** U.S. Census 2000

## 4.3 COMMUNITY FACILITIES AND SERVICES

Figure 4.3-1 depicts a variety of community facilities in relation to the project study area, including police and fire safety services, medical facilities, parks and other recreational facilities, schools, and churches.

### 4.3.1 PUBLIC AND COMMUNITY FACILITIES

The U.S. Postal Service maintains two facilities in the study area: a local post office at 460 Brannan Street and a processing and distribution center at Folsom and Main Streets.

Medical/social welfare facilities include the Seafarers Medical Center, a non-profit clinic at 40 Lansing Street, and the Delancey Street housing complex at Delancey and Brannan Streets on The Embarcadero. Operated by the non-profit Delancey Street Foundation, this four-story complex serves individuals recovering from alcohol and drug-related or other social problems and includes offices of the foundation's moving and transportation company and a restaurant.

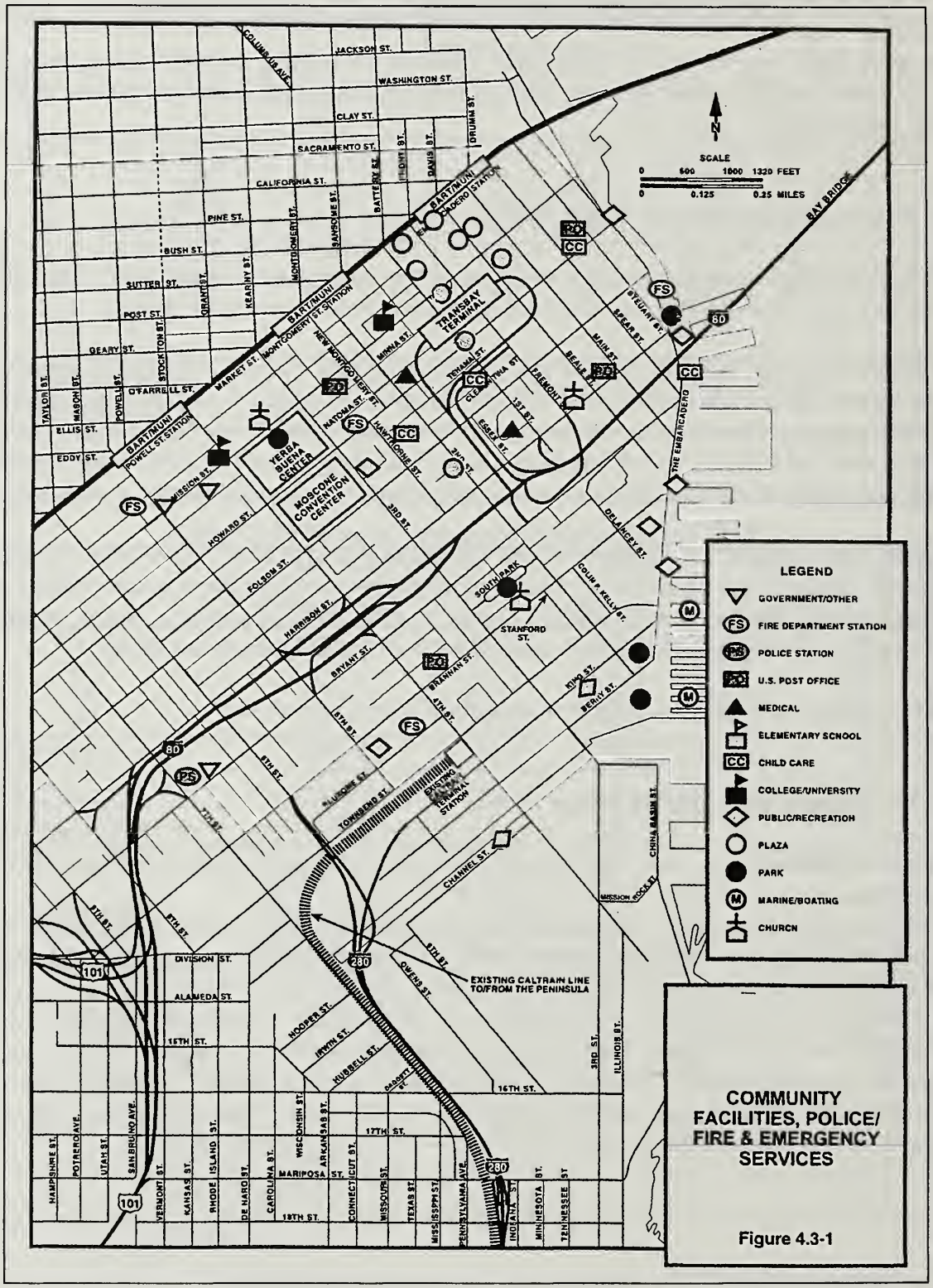
Five child care centers are located within the project study area: Discovery Treehouse Educational Center at 220 Spear Street; Healthy Environmental Child Development Center at 95 Hawthorne Street; Kinderhaven Children's Center at 474 The Embarcadero; South of Market Child Care Inc. at 366 Clementina Street; and PG&E building at Mission and Beale.

Parklands, schools and religious institutions are discussed in Section 4.4.

### 4.3.2 SAFETY AND EMERGENCY SERVICES

#### 4.3.2.1 Police

The San Francisco City Police Department is responsible for general law enforcement in the study area, with both auto and foot patrols daily. The Police Department's Southern Station, located at 850 Bryant Street, provides police protection services to the study area. The Southern Police District is bounded by the Bay on the east, China Basin Channel on the south, Market Street on the north, and Duboce, Thirteenth, and Division Streets on the west. The district also includes the area bounded by Vermont, Sixteenth, and DeHaro Streets. Approximately 120 officers serve this district, and approximately five percent (six officers) are assigned to the proposed Transbay Redevelopment Area.


LEGEND
GOVERNMENT/OTHER
FIRE DEPARTMENT STATION
POLICE STATION
U.S. POST OFFICE
MEDICAL
ELEMENTARY SCHOOL
CHILD CARE
COLLEGE/UNIVERSITY
PUBLIC/RECREATION
PLAZA
PARK
MARINE/BOATING
CHURCH
SCALE
0 600 1800 1320 FEET
0 0.125 0.25 MILES
N
TRANSBAY TERMINAL
YERBA BUENA CENTER
MOSCONE CONVENTION CENTER
SOUTH PARK
EXISTING CALTRAIN LINE TO/FROM THE PENINSULA
BAY BRIDGE
THE EMBARCADERO
COMMUNITY FACILITIES, POLICE/ FIRE & EMERGENCY SERVICES
Figure 4.3-1

In 2000, approximately 7,374 incidents – about 17 percent of the citywide total of Part I criminal incidents, which include violent crimes such as homicides, burglaries, and assaults – were reported in the Southern District. The average response time (measured from the time the call is received to the time officers arrive on the scene) for the Southern District is approximately five minutes for Priority A calls (life-threatening situations, severe assaults and crimes in progress) and about 15 minutes for Priority B calls (urgent situations where the crime has already occurred), which is about the same as citywide response times.

In addition to the local police force, the California Highway Patrol (CHP) has legal jurisdiction over the Transbay Terminal building and provides law enforcement officers to patrol the interior and the sidewalks surrounding the structure. Other security and enforcement agencies with jurisdiction in or near the study area include Amtrak, whose security officers police Caltrain vehicles and patrol Caltrain station and parking areas, and Bay Area Rapid Transit (BART) police who patrol the Embarcadero and Montgomery BART stations within the study area. AC Transit and Golden Gate Transit also have security personnel to monitor their facilities in the Transbay Terminal.

#### 4.3.2.2 Fire and Emergency Medical Services

The San Francisco Fire Department provides fire suppression and prevention services as well as first response to medical emergencies. There are two fire stations within the study area: Station 1, located at 676 Howard Street, has fifteen personnel and is equipped with one engine (pumper), one (ladder) truck, one heavy rescue squad, and one ambulance; Station 8, at 36 Bluxome Street, has thirteen personnel, including a Battalion Chief, and is equipped with one engine, one truck, one hosetender, and one ambulance. Five other stations staffed with from six to fourteen personnel each and equipped with a total of five engines, two trucks, and five ambulances, are located nearby. Station 2, at 1340 Powell Street, has eleven personnel, including a Battalion Chief, and is equipped with one engine and one truck. Station 13, at 530 Sansome Street, has fourteen personnel, including a Division Chief and a Rescue Captain, and is equipped with one engine, one truck, and one ambulance. Station 29, at 299 Vermont Street, has six personnel and is equipped with one engine and one ambulance. Station 35/Fireboats, at Pier 22 ½ has eight personnel and is equipped with one engine, one ambulance, and two fireboats. Station 36, at 109 Oak Street, has six personnel, including a Battalion Chief, and is equipped with one engine, as well as the Department's Hazardous Materials Unit. A new fire station with one engine and an ambulance has recently been proposed to be located in the northeastern portion of the Mission Bay area, although the actual location is as yet unspecified.

The Fire Department uses both the low-pressure hydrant system and the high-pressure hydrant Auxiliary Water Supply System (AWSS) for fire fighting within the Transbay Redevelopment Area and the Caltrain storage yard properties. The AWSS provides an independent secondary source of water exclusively for fire fighting and is just inland of The Embarcadero. Covering the entire study area and vicinity, the AWSS system also includes two additional, back-up emergency water supplies: a Portable Water Supply System that can duplicate the underground

high-pressure system above ground, and a system of underground cisterns. There are five underground cisterns located within the study area, totaling 334,000 gallons of water storage capacity, one at Howard and Beale Streets, one at Howard and First Streets, one at Folsom and First Streets, one at Second and Folsom Streets, and one at First and Harrison Streets. The water mains that serve the area are in satisfactory condition and both the water supply and pressure are considered adequate for fire fighting purposes. The Fire Department has no planned water supply improvements to the AWSS; however, Mayor Willie Brown recently proposed a budget of approximately $180 million for a major upgrade to the City's water system for the fiscal year (2001-02), which, if implemented, should improve the low-pressure system.

Incidents involving known hazardous materials are handled by the Fire Department's Hazardous Materials Unit (Haz Mat 1), which is made up of members from Engine Company 36, located at 109 Oak Street, and backed by Rescue Unit and Battalion 2 members. The San Francisco Fire Code (as well as the San Francisco Health Code) establishes a system for permitting and monitoring the use and disposal of hazardous materials.

Emergency medical services in San Francisco are provided by Fire Department ambulances, which are complemented by Fire Department Rescue Units, and engines and trucks with "first response" capability. Ambulance Zone 1, the busiest of all eight San Francisco Zones, spans the study area, which represents nearly one fourth of the zone. Zone 1 extends from Van Ness Avenue on the west, Townsend Street on the south, and The Embarcadero on the northeast.

#### 4.3.2.3 Disaster Preparedness

The San Francisco Mayor's Office of Emergency Services plans and coordinates emergency services in the event of a natural disaster. The City's Disaster Preparedness Plan divides the City into 10 districts. The Transbay Terminal and the Transbay Redevelopment Area are in District Three – South of Market Southern Waterfront. The designated fire station in the area is Battalion Station 8, located at 38 Bluxome Street. The designated first aid shelter is the South of Market Health Center located at 551 Minna Street. A staging area for the district has yet to be designated.

#### 4.3.2.4 Solid Waste Management

Solid waste throughout the City is collected by Golden Gate Disposal Company and Sunset Scavenger Company, both subsidiaries of Norcal Waste Systems, Inc. Waste is transported to a transfer station at the San Francisco-Brisbane border, where it is hauled by the Sanitary Fill Company to the Altamont Landfill northeast of Livermore in Alameda County. San Francisco has a contract for disposal of all of its solid waste, up to a total of 15 million tons, at the Altamont Landfill until approximately 2010, the year at which the tonnage limit is expected to be reached, depending on changes in the rates of waste generation and diversion. At the beginning of 2001, about 6.4 million tons of contracted capacity remained at Altamont. Once the tonnage limit at Altamont has been reached, the City would likely contract with the Altamont Landfill or another nearby landfill for additional disposal capacity.

Approximately 42 percent of San Francisco's solid waste stream was diverted in 1999. Since the majority of waste produced is in the commercial and industrial sectors, much of the City's ability to reach the State mandated (AB 939) 50 percent diversion goal will rely on the reduction and diversion of commercial and industrial waste. Various conservation activities, such as recycling and public outreach programs, are in progress that may further reduce the volumes going to landfill.

## 4.4 PARKLANDS, SCHOOLS AND RELIGIONS INSTITUTIONS

### 4.4.1 PARKLANDS AND RECREATIONAL FACILITIES

Although the largely developed study area is notable for lack of publicly accessible open space and parks within its boundaries, the area does include public parks, a municipal marina, public waterfront areas, and several public plazas, as shown on Figure 4.3-1. South Park, described below, is the only open space within the study area under the jurisdiction of the San Francisco Recreation and Park Department. However, the Recreation and Park Department publicly provides and maintains open space near the study area including the South of Market Recreation Center, located on Sixth Street at Folsom Street, and Justin Herman Plaza at the foot of Market Street at The Embarcadero.

South Park, encircled by South Park Avenue between Second and Third Streets, is an approximately one-acre, wooded neighborhood park with pedestrian sidewalks and benches and a children's play area. South Beach Park is an approximately three-acre city park located along The Embarcadero between King Street and China Basin. South Beach Park adjoins the South Beach Harbor, a 690-boat berth marina for small boats. Mission Creek Park is approximately 15 acres, with portions bordering the north and south edges of China Basin Channel. The park is being developed as part of the Mission Bay North Redevelopment Plan. Rincon Point Park is approximately three acres located along The Embarcadero at Folsom Street, developed as part of the Rincon Point Redevelopment Plan. With the reconstruction of The Embarcadero roadway between Market and King Streets, improvements have been made along the Bay that provide increased public access and a continuous pedestrian walkway (Herb Caen Way) between South Beach Harbor, Market Street, and points north.

To the south and west of South Beach Harbor is China Basin, a channel extending from San Francisco Bay inland to just east of Seventh Street and I-280. The basin provides berths for sailboats, houseboats, and other moderately sized craft in the channel area west of Fourth Street. Along the south bank of the basin, just outside of the project area, is a linear community park with a pedestrian way and community garden plots.

Within the commercial office district in the vicinity of the Transbay Terminal are a number of privately developed plazas open to the public. Some are at street level; others are elevated and accessible by stairs or escalators.

Recreational facilities near the Caltrain Station at Fourth and Townsend include San Francisco Tennis Club at 645 Fifth Street and Pacific Bell Park, a 45,000-seat baseball stadium on King Street between Second and Third Streets.

### 4.4.2 SCHOOLS

No public or private schools (grades K-12) are located in the study area. Secondary-level private schools and colleges located within the study area include Golden Gate University's main campus, which is located on Mission Street, between First, Second, and Stevenson Streets. The campus includes administrative offices, classrooms, meeting facilities, and auditoriums. Approximately 5,000 full-and part-time undergraduate and graduate students attend. The Academy of Art College has academic facilities within the study area at 79 New Montgomery and Mission Street, and 180 New Montgomery and Howard Street. Heald College has facility locations at Fremont and Mission Streets and on Howard Street near Third Street. The San Francisco Institute of Architecture (SFIA), a recently formed graduate school in architecture, has a new facility at 555 Howard Street, between First and Second Streets that includes exhibit gallery space, a library, seminar rooms, computer rooms, workshop space, and a design studio. These community facilities are shown on Figure 4.3-1.

### 4.4.3 RELIGIOUS INSTITUTIONS

There is one religious institution in the study area, Apostleship of the Sea at 399 Fremont Street (at Harrison), which also provides temporary housing. The Grand Oriente Filipino Masonic Temple is located at 95 Jack London Street, south of South Park between Second and Third Streets. This religious institution is shown on Figure 4.3-1.

## 4.5 FISCAL/ECONOMIC CHARACTERISTICS

Existing residential and nonresidential privately-owned properties within the study area currently generate revenues to the City and County of San Francisco through direct and indirect taxation. These revenues include property taxes, payroll taxes, retail sales taxes, parking taxes, and other less significant taxes, such as utility taxes. Tax revenues associated with the properties to be acquired for the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project are estimated in Section 5.6, Fiscal and Economic Impacts, which also includes an estimate of property acquisition costs.

Total revenues for the City and County of San Francisco in Fiscal Year 1999-2000 were approximately $2.5 billion, including $1.4 billion in tax revenues. Property taxes, which accounted for an estimated $544 million of the total revenues, are levied on the assessed value for all privately-owned property. The property tax rate for Fiscal Year 1999-2000 was 1.129 percent. Of the collected property tax, approximately 75 percent was allocated to the City and County of San Francisco's general fund; the remaining 25 percent of property tax revenues accrued to debt service and special revenue funds.

Business taxes accounted for approximately $268 million of Fiscal Year 1999-2000 revenues. At the time, business taxes paid by individual businesses were based on the payroll tax or a gross receipts tax, whichever netted the larger tax amount. The payroll tax was levied on payroll expenses of persons or associates doing business in San Francisco, while the business tax was a gross receipts tax on all business activities performed by persons or associates in San Francisco. Subsequently, business tax payments in the City and County of San Francisco were changed to be solely based on the payroll tax.

In Fiscal Year 1999-2000, the City and County of San Francisco's revenues included $547 million in "other local taxes," which largely included sales taxes. The total sales tax rate in San Francisco in Fiscal Year 1999-2000 was 8.25 percent. Of this amount, the City and County of San Francisco received 1.25 percent (i.e., 1.00 percent to the City and 0.25 percent to the County). In San Francisco another 1.0 percent is levied and apportioned among the San Francisco County Transportation Authority, the San Francisco Educational Finance Authority, and the San Francisco Public Finance Authority.

Other major revenue sources for San Francisco in Fiscal Year 1999-2000 were intergovernmental transfers ($805 million), charges for services ($186 million), rents and concessions ($72 million), and interest and investment income ($47 million).

## 4.6 AIR QUALITY

This section describes regional, state, and federal air pollutant standards and presents information regarding existing air quality in the project area and vicinity.

### 4.6.1 Federal, State, and Local Air Quality Standards

The Federal Clean Air Act of 1970 resulted in the adoption of federal air pollutant standards, known as National Ambient Air Quality Standards (NAAQS), for pollutants including carbon monoxide (CO), ozone ($O_3$), sulfur oxides ($SO_x$), nitrogen oxides ($NO_x$), and particulate matter less than 10 microns in diameter ($PM_{10}$), and fine particulate matter ($PM_{2.5}$). Areas exceeding federal NAAQS are identified and designated as nonattainment areas. The state air pollutant standards are known as the California Ambient Air Quality Standards (CAAQS), and are generally more stringent than the NAAQS. Federal and state standards are shown in Table 4.6-1.

Existing compliance (i.e., area "attainment") with the NAAQS and CAAQS for criteria pollutants is discussed below, along with existing pollutant concentrations.

**Table 4.6-1: Federal and State Ambient Air Quality Standards**

| Pollutant | Averaging Time | National Standard | California Standard |
|---|---|---|---|
| Ozone | 1 hour<br>8 hour | 0.12 ppm*<br>0.08 ppm | 0.09 ppm<br>N/A |
| Carbon Monoxide | 1 hour<br>8 hour | 35 ppm<br>9 ppm | 20 ppm<br>9.0 ppm |
| Nitrogen Oxides | 1 hour<br>annual | ---<br>0.053 ppm | 0.25 ppm<br>--- |
| Sulfur Dioxide | 1 hour<br>24 hour<br>annual | ---<br>365 $\mu$ g /$m^3$<br>80 $\mu$g /$m^3$ | 0.25 ppm<br>0.04 ppm<br>--- |
| Suspended Particulates ($PM_{10}$) | 24 hour<br>annual | 150 $\mu g/m^3$<br>50 $\mu g/m^3$ | 50 $\mu g/m^3$<br>30 $\mu g/m^3$ |
| Particulate Matter - Fine ($PM_{2.5}$) | 24 hour<br>annual | 65 $\mu g/m^3$<br>15 $\mu g/m^3$ | ---------- |

* ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter

**Source**: California Air Resources Board, 1999.

The project site is within the San Francisco Bay Area Air Basin (BAAB), which comprises the nine-county Bay Area. Air quality in the BAAB is regulated primarily by the Bay Area Air Quality Management District (BAAQMD), which is responsible for regulating stationary source emissions and submitting federally- and state-required documentation to the California Air Resources Board (ARB). The ARB regulates mobile source emissions and is responsible for reviewing state-required documentation submitted by regional agencies such as the BAAQMD, and for submitting federally-required documents to the United States Environmental Protection Agency (US EPA).

Regionally, BAAQMD has standards for project-related air contaminant emissions levels that it considers significant. These standards, expressed in terms of pounds per day, are presented in Table 4.6-2.

**Table 4.6-2: BAAQMD Thresholds for Project-Related Contaminant Emissions**

| Pollutant | Pounds per Day From Project Operations |
|---|---|
| Reactive Organic Gas | 80 |
| Nitrogen Oxides | 80 |
| $PM_{10}$ | 80 |

**Source**: Bay Area Air Quality Management District, BAAQMD CEQA Guideline, Table 3, pg. 15, April 1996.

### 4.6.2 Existing Air Quality and Regional Attainment Status

The transport and concentration of air pollutants are influenced by three principal meteorological factors: wind direction, wind speed, and atmospheric stability. The San Francisco Bay Area is in a large basin enclosed by hills that open into valleys. This topography creates the potential to trap and accumulate air pollutants and combines with variable weather conditions, airflow, and wind speeds to cause differing air pollution concentrations.

Existing air quality conditions in the study area are reflected by measurements taken at BAAQMD monitoring stations. The nearest monitoring station is the Arkansas Street monitoring station in San Francisco, located at 10 Arkansas Street, near Potrero Hill. Table 4.6-3 presents five years of data at this station to demonstrate pollution trends. The table also indicates federal and state standards for these pollutants, and where these pollutant standards have been exceeded.

According to BAAQMD, the BAAB is in attainment with national standards for carbon monoxide, nitrogen dioxide, sulfur dioxide, and annual PM10. It is designated non-attainment for ozone, and unclassified for PM2.5 and 24-hour PM10. With respect to California standards, the BAAB has attainment status for carbon monoxide, nitrogen dioxide, and sulfur dioxide. It is designated non-attainment for ozone and PM10.

The Bay Area experienced no days over the federal ozone standard in 1997, eight days in 1998, three days in 1999, and three days in 2000. This pattern can be attributed to differences in the number and severity of episodes of "ozone conducive" weather from one year to another. Even though there has been steady progress in reducing total volatile organic compounds (VOC) and NOx emissions in the Bay Area, the reductions have not been enough to prevent exceedences of the ozone standards under all meteorological conditions. The BAAQMD, the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG) recently prepared the Bay Area 2001 Ozone Attainment Plan. This plan is a revision to the Bay Area part of California's plan to achieve the national ozone standard. The plan was prepared in response to EPA's Federal Register notice of March 30, 2001 proposing to partially approve and partially disapprove the Bay Area's 1999 Ozone Attainment Plan. At a public hearing on October 24, 2001, the MTC and ABAG boards adopted the Plan and subsequently submitted it to the ARB. The ARB approved the 2001 Ozone Attainment Plan on November 1, 2001 and forwarded the Plan to the US EPA for review and approval.

**Table 4.6-3: Air Quality Standards, Ambient Measurements and Violations, Arkansas Street, San Francisco**

| Pollutant | State Standard | Federal Standard | Year | Maximum Level | Violation Days |
|---|---|---|---|---|---|
| Ozone<br>1 hour | 0.09 ppm | 0.12 ppm | 1996<br>1997<br>1998<br>1999<br>2000 | 0.07<br>0.07<br>0.05<br>0.08<br>0.06 | 0/0<br>0/0<br>0/0<br>0/0<br>0/0 |
| Particulates ($PM_{10}$)<br>24 hours | 50 $\mu g/m^3$ | 150 $\mu g/m^3$ | 1996<br>1997<br>1998<br>1999<br>2000 | 70.9<br>81.0<br>52.4<br>77.9<br>63.2 | 2/0<br>3/0<br>1/0<br>6/0<br>2/0 |
| Carbon Monoxide<br>8 hour | 9.1 ppm | 9.5 ppm | 1996<br>1997<br>1998<br>1999<br>2000 | 3.8<br>3.5<br>4.0<br>3.7<br>3.2 | 0/0<br>0/0<br>0/0<br>0/0<br>0/0 |
| Nitrogen Oxides | 25 ppm – 1 hr | 0.05 ppm – annual | 1996<br>1997<br>1998<br>1999<br>2000 | 0.08<br>0.07<br>0.08<br>0.10<br>0.07 | 0/0<br>0/0<br>0/0<br>0/0<br>0/0 |
| Sulfur Dioxide | 0.05 ppm – 1 hr | 0.14 ppm – 24 hr | 1996<br>1997<br>1998<br>1999<br>2000 | 0.008<br>0.007<br>0.005<br>0.007<br>0.008 | 0/0<br>0/0<br>0/0<br>0/0<br>0/0 |

**Notes:**
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
Violation days = number of days exceeding State or federal standard
**Source:** California Air Resources Board, Air Quality Data, 1996-2000.

### 4.6.3 REGULATORY SETTING

As amended in 1990, the federal Clean Air Act provides the current framework for air conformity. The Clean Air Act defines conformity to mean:

> "Conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards . . ."

Section 176 of the Clean Air Act specifies that no federal agency may approve, support, or fund an activity that does not conform to the applicable implementation plan. In late 1993, the EPA promulgated final rules for determining conformity of transportation plans, programs, and

projects. These final rules, contained in 40 CFR 93A (Code of Federal Regulations), govern the conformity assessment for the proposed project.

The BAAQMD, in coordination with the MTC and ABAG, is responsible for preparing air quality plans pursuant to the Federal and California Clean Air Acts. Under the Federal Clean Air Act, State Implementation Plans (SIPs) are required for areas that are designated as non-attainment for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, or inhaleable particulate matters. For the BAAB, a SIP is required for ozone since the region is currently designated as a federal non-attainment area for ozone. As discussed previously, the most current SIP is called the Bay Area 2001 Ozone Attainment Plan, which was adopted by the MTC, ABAG, and BAAQMD in October 2001. ARB adopted this Plan in November 2001, and EPA approved the associated emissions budget in February 2002.

Whereas the SIP is prepared pursuant to the Federal Clean Air Act, the Bay Area Clean Air Plan (CAP) is prepared to meet the requirements of the California Clean Air Act. The CAP is the region's plan for reducing ground-level ozone. The CAP identifies how the BAAB would meet the state ozone standard by its attainment date. The 2000 CAP focuses on identifying and implementing control measures that would reduce ozone. It was adopted by the BAAQMD in December 2000.

The MTC is responsible for *ensuring* that the Bay Area Regional Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP) conform to the SIP. *The 2001 RTP was adopted by MTC in March 2002 following EPA's approval of the Bay Area mobile source emissions budget. The 2003 TIP was adopted by the MTC on January 22, 2003 and was federally approved on February 3, 2003."*

## 4.7 NOISE AND VIBRATION

### 4.7.1 EXISTING NOISE ENVIRONMENT

The noise environment of the study area, like that in most urban areas, is dominated by automobile and truck traffic noise, with traffic on the Bay Bridge most pervasive in areas closest to the Bridge. Other noise sources in the project area include small aircraft flyovers and normal community activity.

A noise survey was conducted in July 1995, with one additional noise measurement in November 1996, for the Caltrain San Francisco Downtown Extension Draft EIS/EIR. Additional noise analysis was done in 2001. The original survey documented the existing noise environment in the study area and provided data necessary for accurate estimation of how the noise environment would change under project alternative conditions. Long-term (24-hour) noise monitoring sites were located at residential complexes and the site of a planned residential high-rise. Short-term (30 minutes) measurement sites were located near sensitive receptors

along the proposed alignments and near roadways that are the primary contributors to ambient noise levels.

The data obtained in the 1995-96 noise survey remain valid for the current project. Noise conditions in the corridor have not changed substantially. Supplementary measurements were taken in May and June of 2001. Table 4.7-1 presents results of the 24-hour and short-term surveys, and Figure 4.7-1 indicates the locations of the noise measurement sites.

**Table 4.7-1: Summary of Noise Survey Results**

| Location | Type | Start | | Results (dBA) | |
|---|---|---|---|---|---|
| | | Date | Time | $L_{dn}$ | $L_{eq}$ |
| LT1: Bayside Village | 24-hour | 7/24/95 | 11:00 | 72 | -- |
| LT2: Bay Crest Residential | 24-hour | 7/24/95 | 12:00 | 76 | -- |
| LT3: Delancey Street | 24-hour | 7/25/95 | 13:00 | 71 | -- |
| LT4: South Beach Marina | 24-hour | 7/25/95 | 14:00 | 64 | -- |
| LT5: Oriental Warehouse | 24-hour | 7/26/95 | 15:00 | 67 | -- |
| LT6: Townsend Street | 24-hour | 6/18/01 | 08:00 | 76 | -- |
| ST1: Parking Lot near Bayside Village | 30-minute | 7/25/95 | 16:52 | 72* | 69 |
| ST2: South Beach Marina | 30-minute | 7/26/95 | 10:08 | 67* | 64 |
| ST3: Bayside Village, Bryant Street | 30-minute | 7/26/95 | 16:56 | 71* | 68 |
| ST4: Parking Lot, Planned Residential (Century Development) | 30-minute | 7/26/95 | 18:18 | 60* | 57 |
| ST5: Bay Crest Residential, Beale Street | 30-minute | 7/27/95 | 14:05 | 75* | 72 |
| ST6: Residential between Folsom and Harrison, Essex Street side | 60-minute | 11/4/96 | 15:50 | 68* | 65 |
| ST 7: Parking lot south of existing Caltrain Station and yard | 30-minute | 6/18/01 | 11:51 | 71* | 69 |
| ST 7: Parking lot south of existing Caltrain Station and yard | 30-minute | 6/19/01 | 07:43 | 71* | 67 |

* $L_{dn}$ at short-term sites estimated as $L_{eq}$ + 3 dBA.

**Source:** Harris Miller Miller & Hanson, August 2001.

The results are typical for an urban area and are presented in terms of the $L_{eq}$ (Equivalent Sound Level), which is the standard measure for traffic noise, and $L_{dn}$ (Day-Night Equivalent Sound Level), which is a good representation of community noise levels.[1]

[1] $L_{eq}$ is a measure of noise exposure over time, which is referred to as "equivalent" since it is equivalent to the level of a steady sound which, over a referenced duration and location, has the same A-weighted sound energy as fluctuating sound. Durations of one hour and one day are commonly used. $L_{dn}$ is a measure of noise exposure over a 24-hour period, with an adjustment for nighttime noise to account for people being more sensitive to nighttime noises. Both measurements are presented here in terms of dBA, or A-weighted decibels, which are logarithmic units of measurement filtered to approximate human hearing.

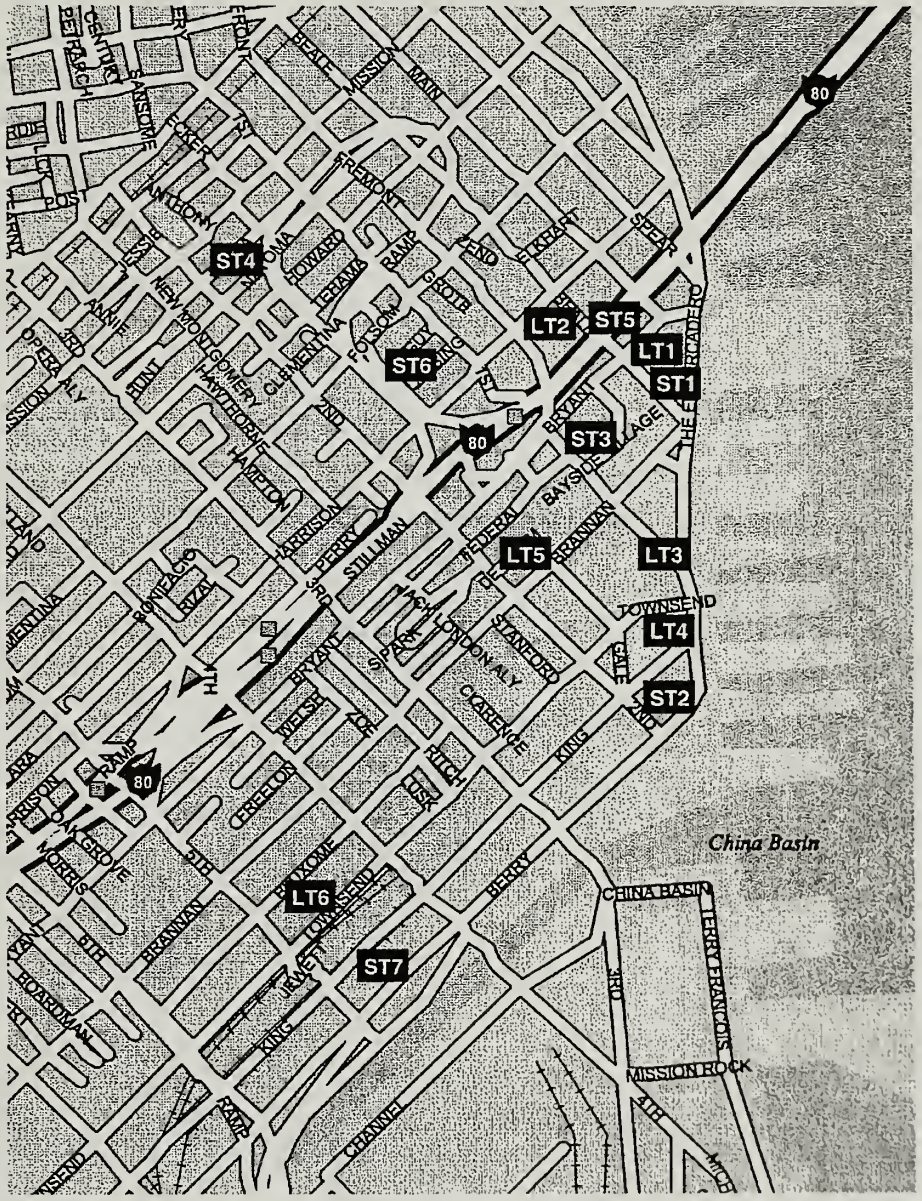



**Figure 4.7-1: Noise Monitoring Locations**

To account for most people being more sensitive to noise during nighttime hours, the calculation of $L_{dn}$ includes a weighting factor for noise that occurs between the hours of 10 PM and 7 AM. The effect of this weighting factor is that a noise event, such as a loud truck, that occurs during the nighttime is equivalent to ten of the same events during daytime hours.

As shown in Table 4.7-1, existing $L_{dn}$ measurements in the study area range from 60 to 76 dBA. The highest noise levels were measured at sites directly exposed to the Bay Bridge traffic. The lowest levels of noise exposure were measured at the South Beach Marina Apartments and at the site for the Century development. The South Beach Marina site was completely shielded from the bridge. Although the Century Development site is just south of Mission Street near several high traffic volume streets where $L_{dn}$ would normally range between 65 to 70 dBA or higher, the noise levels are relatively low due to the shielding effect of large buildings around the site.

### 4.7.2 EXISTING VIBRATION

Ambient vibration measurements were performed as part of the 1995 noise survey and were taken simultaneously with the noise measurements at the five short-term measurement sites. Supplemental vibration measurements were taken in May and June of 2001 to further define the vibration propagation characteristics along the Second Street corridor, and to characterize the response of representative buildings to ground-borne vibration. The major existing sources of ground-borne vibration are traffic on local streets, particularly large buses and trucks, mechanical equipment associated with buildings, and existing Caltrain and Muni operations. Figure 4.7-2 indicates the locations of the vibration propagation test sites. Table 4.7-2 presents results of the vibration survey in terms of the range of route mean square (RMS) vibration velocity expressed in decibels (VdB in this analysis).[2] The normal threshold of human perception of vibration is around 65 VdB, and most people find levels up to 75 to 80 VdB acceptable for residential land uses as long as the vibration happens only intermittently. Typical levels of vibration measured in the study area were in the 40 to 50 VdB range, with the highest level at 58. This indicates that existing ground-borne vibration in the study area is almost always below the threshold of human perception.

The highest levels of ambient ground-borne vibration were measured at the Clock Tower building at Bryant and Second Streets. Both exterior and interior vibration was measured. The exterior location was on the sidewalk relatively close to the street. Even at this location, the highest vibration levels were only slightly above what can be perceived by most humans.

[2] RMS (root-mean-square) amplitude represents the average energy over a short time interval; typically one second is used to evaluate human responses to vibration. RMS is considered the best available measure of potential human annoyance from ground vibration; it differs from peak particle velocity (PPV), which is used to define the thresholds for potential building damage from construction vibration. PPV represents the maximum instantaneous peak in the velocity of an object's vibratory motion. VdB is used in this analysis to denote decibels.

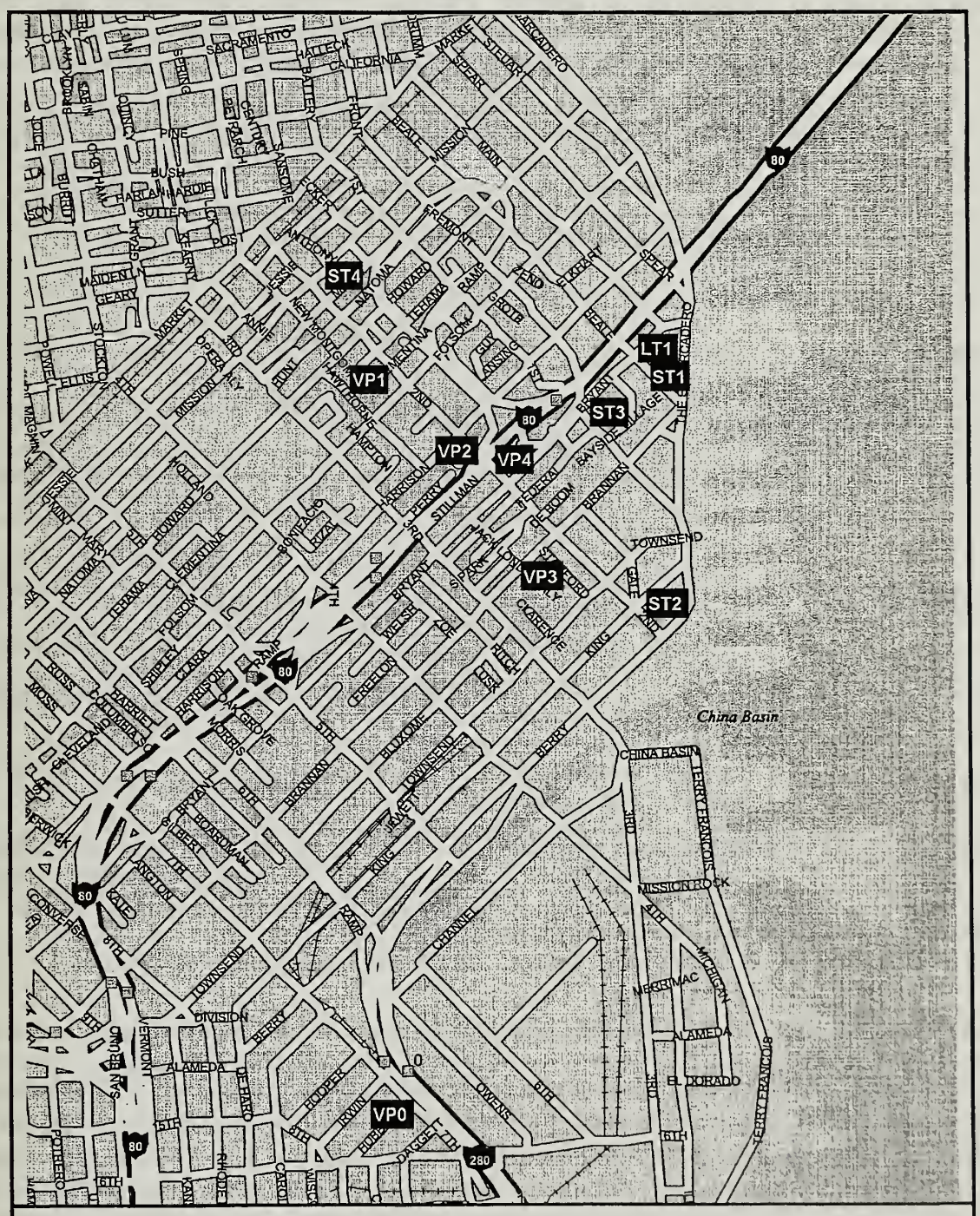



**Figure 4.7-2: Vibration Propagation Test Sites**

In addition to the measurements of ambient vibration, vibration propagation tests were performed to characterize how local geologic conditions affect vibration propagation in the study area. The vibration propagation tests performed for the study area used a weight dropped onto a load cell to cause a ground vibration pulse. The impact force of the weight was measured with the load cell, and accelerometers were used to measure the vibration pulse at distances from 25 to 200 feet away.

**Table 4.7-2: Summary of Ambient Vibration Results**

| Measurement Site [1] | Location | Typical Background Vibration (VdB) [2] | Vibration Sources |
|---|---|---|---|
| V1 (ST1 on Figure 4.7-1) | Parking Lot near Bayside Village | 35-40 | Buses and trucks |
| V2 (ST2 on Figure 4.7-1) | South Beach Marina | 35-40 | Buses and trucks |
| V3 (ST3 on Figure 4.7-1) | Bayside Village, Bryant Street | 40-50 | Cars into building, trucks, traffic on Bay Bridge |
| V4 (ST4 on Figure 4.7-1) | Parking Lot (planned Century residential development) | 35-40 | Cars |
| V5 (ST5 on Figure 4.7-1) | Bay Crest Residential, Beale Street | 40-43 | Trucks, traffic on Bay Bridge, cars |
| V6 (VP2 on Figure 4.7-2) | Harrison Street Parking Lot | 36-40 | Trucks, traffic on Bay Bridge, cars |
| V7 (VP4 on Figure 4.7-2) | Second St. & Bryant (Clock Tower building, exterior) | 55-65 | Trucks, traffic on Bay Bridge, cars, people on sidewalk |
| V8 (VP4 on Figure 4.7-2) | Second St. & Bryant (Clock Tower building, interior) | 50-60 | Trucks, traffic on Bay Bridge, cars |

Vibration measurements at V1 through V5 were taken in conjunction with short-term (ST) noise measurements. Vibration measurements at sites V6 through V8 coincided with vibration propagation (VP) tests.

Vibration levels are in terms of RMS vibration velocity in decibels with a reference quantity of 1 μin./sec.

**Source:** Harris Miller Miller & Hanson, August 2001.

A test of existing Caltrain vibration was also conducted at the intersection of Hubbell and Seventh Streets. The results of this test were used to develop a force density curve that is representative of the existing commuter rail equipment. The results of the vibration propagation tests in combination with the train vibration tests were used to estimate future ground-borne vibration levels from train operations along the proposed Townsend and Second Street corridors. Locations of vibration propagation testing sites are described in Table 4.7-3 and shown on Figure 4.7-2.

**Table 4.7-3: Vibration Propagation Measurement Sites**

| Site # | Description |
|---|---|
| VP0 | Hubbell and Seventh Street (existing train vibration). Both train vibration and transfer mobility were measured at this site. The information was used to develop a force density curve that is representative of the existing commuter rail equipment. The vibration measurements at this site were used to characterize the ground-borne vibration along Townsend before the subway structure would be founded in bedrock. |
| VP1 | Marine Firefighter's Union Building, 240 Second Street (outdoor-to-indoor test). The test at this location represents the high-rise apartment building at 246 Second Street, and the Marriott Hotel under construction across from the Marine Firefighter's Union Building. |
| VP2 | Parking lot adjacent to 400 Harrison Street (outdoor vibration propagation). Near the I-80 overpass at Second Street, this site represents the single family homes between Bryant Street and Brannan Street, west of Second Street. An accelerometer was placed on a landing at the rear of 400 Harrison Street, to provide an estimate of the ground-to-foundation coupling loss between a building and the ground. |
| VP3 | Private parking lot on Brannon Street near Stanford Street (outdoor vibration propagation). This site represents the apartment building on Townsend Street, near the current layover facility. An accelerometer was placed on the foundation of the nearby Pac-Bell garage to provide an estimate of the ground-to-foundation couple loss. |
| VP4 | Clock Tower residential buildings (outdoor-to-indoor vibration test). This site represents the outdoor-to-indoor vibration propagation at the Clock Tower Apartments. |

**Source**: Harris Miller Miller & Hanson, August 2001.

## 4.8 GEOLOGY AND SEISMICITY

This section describes the geology of the project area and the susceptibility of site soils to seismically induced hazards.

### 4.8.1 GEOLOGIC SETTING

The project area, and the San Francisco Peninsula in general, is located in the Coast Ranges geomorphic province, although the dominant northwesterly trend of ridges and valleys characteristic of the Coast Ranges is somewhat obscured within the City of San Francisco, except for features such as Russian and Telegraph Hills. The regional topography is characterized by relatively rugged hills formed by Jurassic- to Cretaceous-aged bedrock, surrounded by low flat-lying areas that are underlain by Quaternary sedimentary deposits. Bedrock consists of highly deformed and fractured sedimentary rocks of the Franciscan assemblage. Locally, Franciscan bedrock contains large through-going shear zones such as the City College and Fort Point --Potrero Hill -- Hunters Point shear zones.

From a geotechnical standpoint, the study corridor is divided into two general areas: the portions of the study area that are located bayward of the historic shoreline, and portions of the study area

on the land side of that line. The portions of the study area that are bayward of the historic (c. 1848) shoreline represent areas reclaimed by filling former marshes and estuaries of the Bay, and include the former Yerba Buena Cove, South Beach, and Mission Bay. (See Figure 4.8-1.) Today these areas include much of the Financial District, South of Market, and Mission Bay areas of San Francisco. Soils in these areas are generally characterized by the presence of soft and compressible Bay Mud, under the surficial fill placed when these areas were reclaimed in the late 1800s and early 1900s. The depth of these sediments varies substantially depending on the position of the area of interest relative to the old shoreline. Fill materials also vary, and may include clay, dune sand, rubble, building demolition debris, buried ships, and other materials.

The portion of the project area that is inland from the historic shoreline is underlain by Franciscan bedrock at the surface or at shallow depths, although Bay Mud extends landward of the 1848 shoreline near the Transbay Terminal and in the southern portion of the project area between Third and Seventh Streets in areas of former marshlands. Quaternary sediments overlie bedrock throughout the project area except for Rincon Hill, which is the only surface exposure of Franciscan bedrock in the project area. Bedrock is less than 10 feet below ground surface near Townsend and Second Streets.

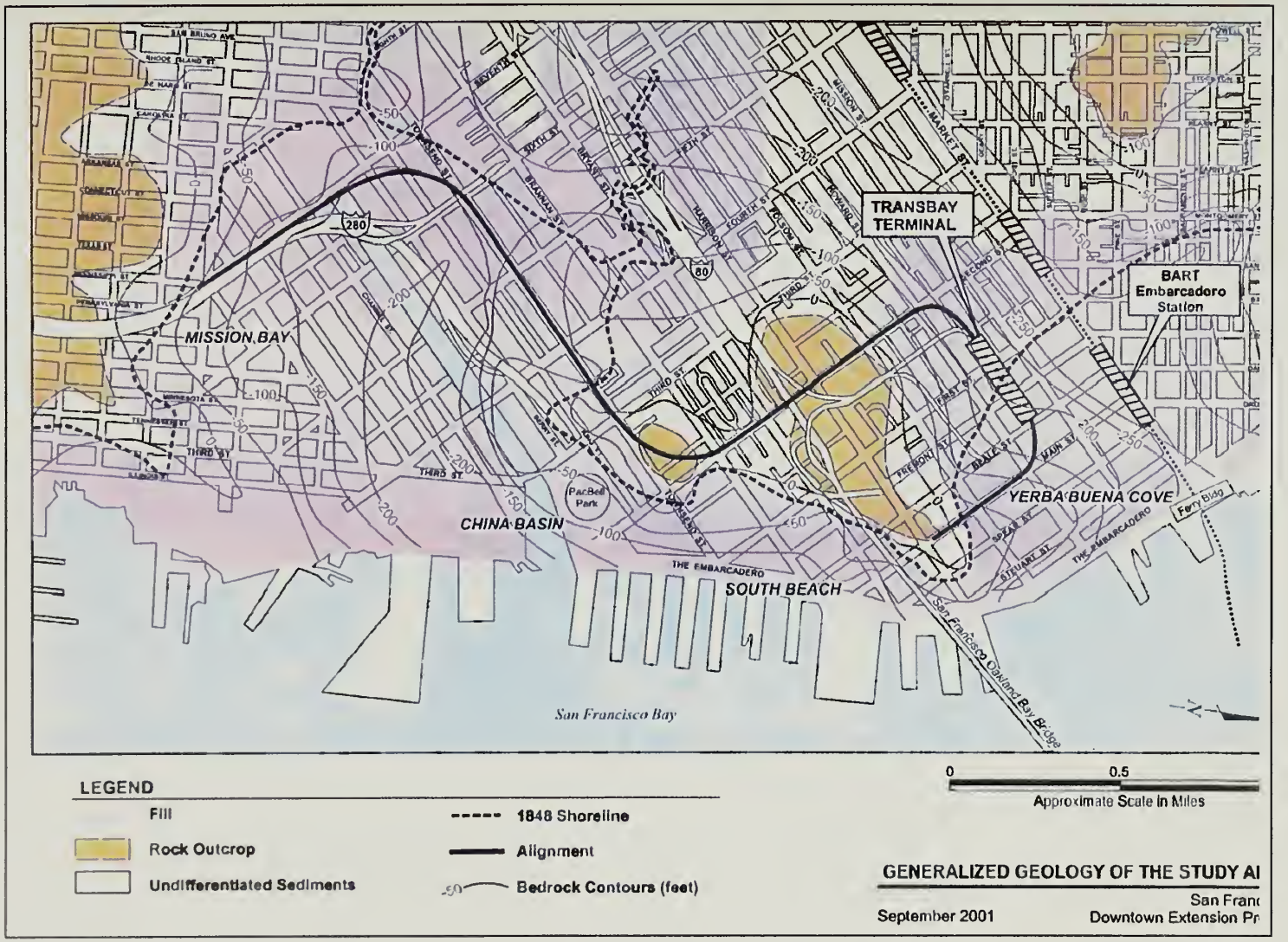
Groundwater is between Seven and 10 feet below ground surface in the flat-lying portions of the project area, which corresponds to elevations of -3 to -10 feet relative to City and County of San Francisco Datum (8.6 feet above mean sea level).

### 4.8.2 Seismic Setting

The project area is seismically active, and ground shaking from earthquakes occurs periodically. Active faults in the Bay Area are illustrated in Figure 4.8-2.

The San Andreas and Hayward faults have the highest slip rates and are the most active of any faults in the Bay Area. The San Andreas Fault, which is approximately 8.5 miles west of the project site, was the source of the 1906 magnitude 8.2 earthquake and the 1989 magnitude 7.1 (Loma Prieta) earthquake. The Hayward Fault, which lies approximately nine miles east of the project site, was the source of the 1836 and 1868 magnitude 6.8 earthquakes. The Calaveras Fault, which is approximately 22 miles east of the project site, was the source of a 1911 magnitude 6 earthquake and a 1984 magnitude 6.2 earthquake.

Other important earthquake sources that are capable of producing large magnitude earthquakes are the San Gregorio, Rodgers Creek, and Greenville fault zones.


TRANSBAY TERMINAL
BART Embarcadoro Station
MISSION BAY
CHINA BASIN
SOUTH BEACH
YERBA BUENA COVE
PacBell Park
Ferry Bldg
San Francisco Bay
San Francisco Oakland Bay Bridge
THE EMBARCADERO
THIRD ST
280
80
LEGEND
Fill
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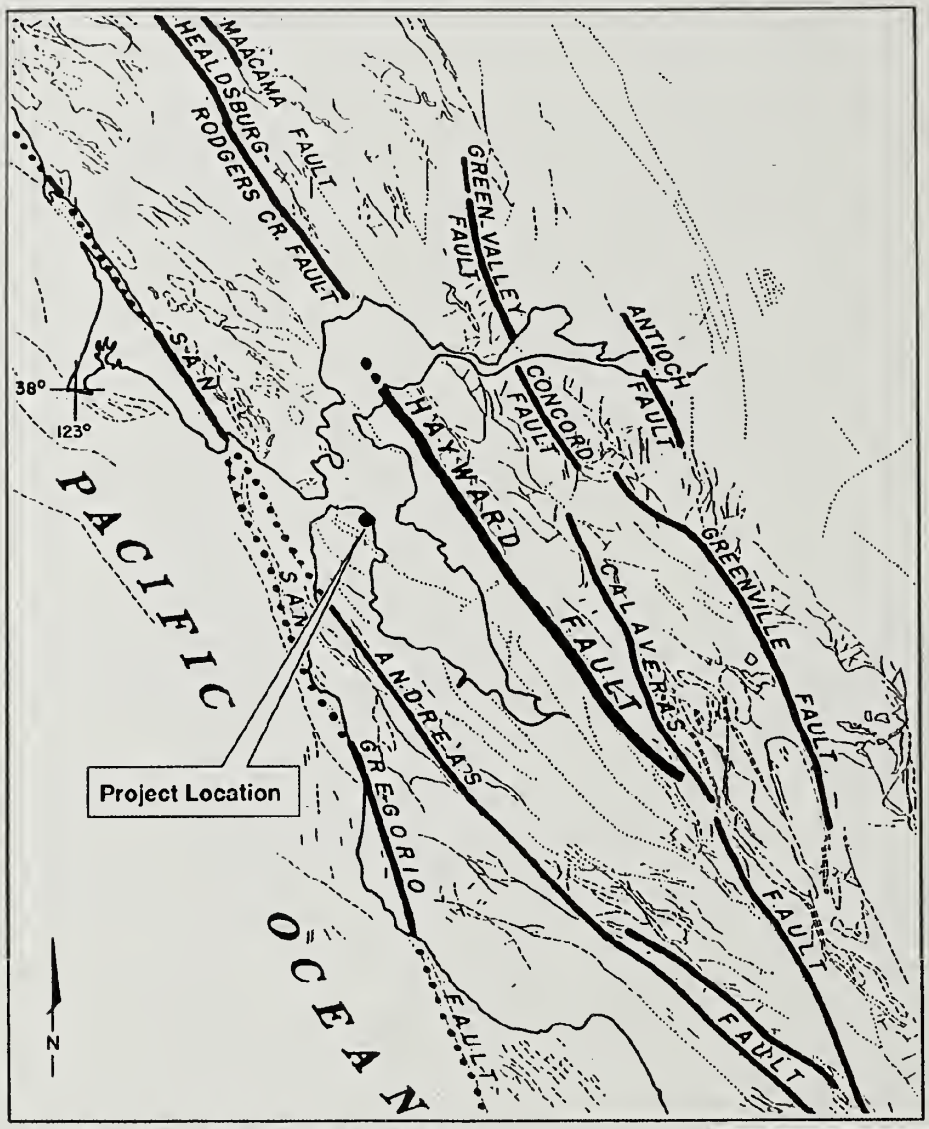



Source: California Division of Mines and Geology, Special Publication 78 (1967)

**LOCATIONS OF ACTIVE FAULTS IN THE SAN FRANCISCO BAY AREA**

**Figure 4.8-2**

4-38

No known faults cross the project alignment; however the faults shown in Figure 4.8-2 may subject the study area to strong ground shaking. Estimates of peak ground acceleration from an earthquake on the San Andreas or Hayward fault within the study area range from 0.2g to 0.5g. Ground failure hazards during an earthquake can include settlement and liquefaction. During the 1989 Loma Prieta earthquake, ground deformation in the project area consisted of settlement, ground cracking, and/or sand boils. These features were observed between Beale Street and The Embarcadero from Market to Harrison Streets, and from Fourth to Ninth Streets between Mission and King Streets.

## 4.9 VEGETATION AND WILDLIFE

Portions of the project area lie within reclaimed areas formed by filling former marshes and estuaries of San Francisco Bay, including Mission Bay, South Beach and Yerba Buena Cove. Except for South Park and landscaping associated with recent residential developments in the South Beach/Steamboat Point area, the vicinity of the proposed project is generally paved with concrete and asphalt. No sizable natural habitat for biological plant, animal, or bird species remains.

Although the project area lies adjacent to the San Francisco Bay, all construction would occur outside the Bay Conservation and Development Commission's 100-foot "shoreline band," and no project alternatives would require filling of or construction within wetlands or Bay waters or affect water quality. No effects on San Francisco Bay bird species are anticipated.

These findings are consistent with the previous environmental studies conducted in the area, including the March 1997 Draft EIS/EIR for the Caltrain Downtown Extension Project, and the Draft EIS/EIR for Alternatives to Replacement of the Embarcadero Freeway and the Terminal Separator Structure, published by the City of San Francisco, Caltrans, and the Federal Highway Administration in 1995. Both these studies addressed an area similar to the present project area. The U.S. Fish and Wildlife Service indicated that no adverse effects on endangered species of wildlife and plants or their habitats are expected from the proposed improvements. A copy of the Service's August 10, 2001, letter is provided in Appendix D.

## 4.10 WETLANDS

The present China Basin Channel is not a naturally occurring tidal creek but the remains of the former Mission Bay. The entire site, like the project area in general, has been altered through extensive urban development or landscaping. No wetlands remain.

## 4.11 WATER RESOURCES

### 4.11.1 Ground Water Resources

The occurrence of groundwater in the project area is related to the nature of shallow soil and bedrock. In the fill areas (see Figure 4.17-1 for the location of fill areas and the historic shoreline.), groundwater occurs at depths of two to ten feet below ground surface, and the elevation of groundwater corresponds with the level of San Francisco Bay. In areas underlain by alluvial soils and shallow bedrock, which generally correspond to the higher elevations in the project area, groundwater is typically found at depths greater than 20 to 30 feet.

Groundwater occurring within fill soils in the project area is expected to be shallow and, therefore, susceptible to contamination from past industrial land use, placement of contaminated fill material, and releases from underground storage tanks (USTs). Groundwater quality may be further degraded by seawater intrusion along The Embarcadero waterfront. The presence of chemical constituents such as petroleum hydrocarbons and chlorides may affect how water generated during construction dewatering will be handled and disposed. The City and County of San Francisco and the California Regional Water Quality Control Board do not consider water in this area suitable for potable supplies, but consider it potentially suitable for industrial purposes, although no known uses are reported within the project area.

The quality of the groundwater in the fill soils is generally poor. Brackish conditions exist in most of the project area due to the proximity of the Bay, where tidal fluctuations are generally in the range of six feet. Seawater intrusion resulting from tidal fluctuations has been known to occur several hundred feet from the Bay and tidal channels (e.g., China Basin Channel). The presence of chlorides in the groundwater can restrict the discharge of dewatering effluent to the City's combined sewer system because of chloride content limits imposed by the San Francisco Department of Public Works (DPW), which operates the sewage treatment plant.

Groundwater encountered in the fill areas of the alignment may contain varying concentrations of petroleum hydrocarbon contaminants, primarily because the South of Market area contains one of the highest densities of USTs in the City (see discussion of Hazardous Wastes, Section 4.17). Hydrocarbon contamination may affect dewatering programs, possibly requiring treatment of pumped groundwater prior to discharge to the storm sewers. Although polynuclear aromatic hydrocarbons (PAH) and lead are present in the fill soils, groundwater has not typically been affected by these contaminants.

### 4.11.2 Surface Water Resources

The relative density of impermeable surfaces within the project area is on the order of 95 percent. Most of the area is completely paved and developed and no surface water bodies exist with the exception of China Basin Channel and San Francisco Bay. All stormwater runoff

in the project area is captured by the City's combined sewer system, with one exception: storm sewers along the bayward portion of The Embarcadero discharge directly to the Bay.

The sewer system is served by an 18-foot by 18-foot box sewer, which runs along The Embarcadero, King, and Berry Streets to a pump station at Berry and Seventh Streets. From the pump station, the water is transported to a sewage treatment plant near Phelps and Jerrold Streets. Data on water quality were not available for the project area; however, due to the heavily urbanized nature of the project area, runoff water quality is expected to be poor.

## 4.12 FLOODPLAINS

The City and County of San Francisco does not participate in the Federal Emergency Management Agency's floodplain identification program, and no floodplains have been identified within San Francisco.

## 4.13 COASTAL ZONE

The McAteer-Petris Act of 1965, as amended, grants the San Francisco Bay Conservation and Development Commission (BCDC) permit authority over San Francisco Bay and over lands located within 100 feet of the Bay shoreline. BCDC's management plan for the San Francisco Bay, The San Francisco Bay Plan, has been certified by the Federal Department of Commerce as the Coastal Zone Management Program for the San Francisco Bay Segment of the California Coastal Zone Management Program pursuant to the Federal Coastal Zone Management Act (CZMA). Under the CZMA, federal projects and local projects that use federal funding or require federal approval must, to the maximum extent practicable, be consistent with a state's coastal management program if the project would affect the coastal zone, and BCDC's authority may extend inland more than 100 feet.

The Second-to-Mission Alternative is the closest alignment to BCDC's jurisdiction. The alignment terminates at Mission Street and The Embarcadero and is approximately 190 feet (63 yards) from the shoreline. The alignment would not have any effects on shoreline access or water quality. No formal finding of consistency with the Coastal Zone Management Plan (i.e., the San Francisco Bay Plan) would therefore be required.

## 4.14 UTILITIES

The San Francisco Department of Public Works maintains a combined storm drain and sanitary sewer system in the Transbay Terminal, Caltrain Downtown Extension, and redevelopment area. Sewer types include vitrified clay pipe (VCP); older iron/steel pipe (ISP); very old brick collector sewers; medium-sized reinforced concrete interceptor sewers, and large reinforced concrete consolidation sewers that carry sewage and storm water from downtown to the

Southeast Treatment Plant. Sewers range in size from eight inch VCP to seven feet circular concrete.

The San Francisco Water Department maintains an interconnected grid of service lines throughout the area, and the San Francisco Fire Department maintains a second parallel system of auxiliary water lines exclusively for supplying fire hydrants (with potable water) and with provision for supplying salt water from the Bay for fire fighting. Water lines are primarily cast iron and range in size from two to 30-inches.

The City and County of San Francisco owns and operates the Hetch Hetchy water and power hydroelectric generating facilities that provide power to San Francisco via Pacific Gas and Electric Company's (PG&E) electrical transmission and distribution system. Electricity service is provided primarily from underground reinforced concrete vaults through a network of buried conduit and duct banks. PG&E maintains older, low-pressure cast iron natural gas lines from four to 16 inches in diameter, as well as new, high-pressure plastic lines from two to four inches in diameter.

Communication networks interlace the area. Most communication equipment is owned and operated by Pacific Bell and routed underground, similar to electrical service.

## 4.15 ELECTROMAGNETIC FIELDS

Electromagnetic fields (EMF) are associated with electromagnetic radiation, which is energy in the form of photons. Radiation energy travels and spreads as it goes and has many natural and human-made sources. The electromagnetic spectrum, the scientific name given to radiation energy, includes light, radio waves, and x-rays, among other energy forms. For purposes of describing the EMF setting for the proposed project and, in Chapter 5, the EMF effects of the proposed project, human-made sources of radiation energy and associated EMF are relevant.

The commonly known human-made sources of EMF are from electrical systems such as electronics, telecommunications, electric motors, and other electrically powered devices. The radiation from these sources is invisible, non-ionizing, and low frequency. Generally, in most living environments, the level of such radiation plus background natural sources of EMF is low and not considered hazardous. However, under extreme conditions, EMF can become intense, and hazards include shock and burn. Such conditions are nevertheless rare. The more pertinent concern over EMF exposure is the potential insidious biological and health effects to individuals as the number of EMF-generating activities increases. As more sources of EMF are introduced, the extent and level of human exposure increases. The potential biological and health effects are under much study and intense debate.

Another concern over EMF generation is the potential interference to other electromagnetic systems that can result when new or more intense sources of radiation are introduced into the environment. These effects are better understood and well documented. Electromagnetic

interference (EMI) may include the interruption, obstruction, or other degradation in the effective performance of electronics and electrical equipment. Depending upon the critical nature of this equipment, the effects can have serious consequences for the health and safety of individuals. Perhaps of less concern, but nonetheless important, is that the efficiency of affected systems may be reduced.

As the name implies, EMF has electrical and magnetic field components. With respect to electrical systems, electric fields result from the strength of the electric charge (voltage) while magnetic fields result from the motion of the charge. Direct current (DC) produces stronger EMFs than alternating current (AC). Electric field strength is measured in units of volts per meter (V/m) and is greater the higher the voltage. Field strength deteriorates rapidly with distance from the source. Magnetic field strength has several units of measure; the most commonly used are milligauss (mG) and the microTesla (mT). Ten milligauss equal one microTesla. Magnetic fields also deteriorate with distance but readily pass through most objects. Magnetic fields are typically the radiation of concern when evaluating EMFs. Consequently, EMF strength is measured in terms of milligauss.

Although modern society increasingly relies on electromagnetic systems, strong EMF fields are not associated with the normal living and working environment. Examples of EMF intensities from human activities include the following:

| | |
|---|---|
| Overhead power transmission line: | 32 to 57 mG (range of exposure to utility workers) |
| Household appliances: | 8 to 165 mG (at a distance of 27 cm, or 12 inches) |
| Computer video display: | 2 to 4 mG (at 35 cm, or 16 inches) |
| Rail vehicle (electrically powered) | 400 mg (at 110 cm, or 43 inches from the vehicle floor) to 1,500 mG (at floor level)[3] |

For comparison, in the natural environment apart from human activity, the earth's static magnetic field varies from 300 mG at the equator to over 600 mG at the magnetic poles.

The area of the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project is a moderate- to high-density urban environment with considerable commercial activity. As such, it contains numerous sources of EMFs. A major PGE substation exists at Fremont and Folsom Streets, and several telecommunications switching stations exist near Main and Spear and Harrison and Folsom Streets.

Sources of electromagnetic radiation would appear to be increasing with densification and development of the area, although the effects on EMF levels are indeterminate without historic data. Many modern appliances, electronics and communications systems have been improved to reduce electromagnetic radiation/EMF levels.

[3] Safety of High Speed Guided Ground Transportation Systems, EMF Exposure Environments Summary Reports, Federal Railroad Administration, August 1993.

The project area contains no known sources of high-level radiation or severe EMF exposures to the general public. EMF exposures, although common, are low-level.

## 4.16 HISTORIC AND CULTURAL RESOURCES

Potential historical and archaeological resources in the project area have been identified and evaluated in accordance with applicable regulations and guidelines. This section reports on the identification of such resources.

### 4.16.1 Regulatory Setting

Section 106 of the National Historic Preservation Act of 1966 requires federal agencies to take into account the effects of their activities and programs on historic properties. Section 110 of the Act lays out affirmative agency responsibilities with respect to historic properties and establishes the National Register of Historic Places (NRHP) for identifying and listing historic properties of importance to the nation, the states, and local communities.

Guidelines for implementing Section 106 requirements are promulgated by the Advisory Council on Historic Preservation (ACHP) in "Protection of Historic Properties" (36 CFR Part 800). These guidelines require agencies to comply also with other federal laws related to historic preservation, including the National Environmental Policy Act of 1969; the Archaeological and Historic Preservation Act of 1979; and Executive Order 11593 (1971), addressing "Protection and Enhancement of the Cultural Environment." Other agency-specific legislation requires consideration of the impacts of federal actions on cultural resources. Transportation projects must comply with the provisions of Section 4(f) of the Department of Transportation Act of 1966.

The State of California references cultural resources in the California Environmental Quality Act (CEQA—Public Resources Code (PRC) Division 13, Sections 21000-21178); archaeological and historical resources are specifically treated under Sections 21083.2 and 21084.1, respectively. California PRC 5020.1 through 5024.6 (effective 1992) creates the California Register of Historical Resources and sets forth requirements for protection of historic cultural resources.

The City and County of San Francisco has two sections of its Planning Code that deal specifically with the preservation of historic resources. Article 10 created the Landmarks Preservation Advisory Board and deals with the designation of landmarks and historic districts throughout the City. Article 11 deals with the preservation of historic buildings and creation of historic districts within the C-3 Districts (generally the downtown or central business district of San Francisco). The Landmarks Preservation Advisory Board makes recommendations to the Planning Department and Commission on the designation of landmarks and districts as well as the appropriateness of changes to historic buildings under the protection of Article 10 and permits to alter under Article 11. The City-designated structures and districts in Articles 10 and

11 are presumed historic resources under the California Environmental Quality Act (CEQA) as they are on a local register. In addition, resources listed or determined eligible for listing in the California Register of Historic Resources or in the Nation Register of Historic Places (NRHP) are also considered historic resources under CEQA.

### 4.16.2 Archaeological Area of Potential Effects

An Area of Potential Effects (APE) for archaeological resources was delineated by FTA in consultation with the State Historic Preservation Officer (SHPO). This APE was defined as the extent of proposed construction for the project (i.e., the project "footprint"). The locations of project components are shown in Chapter 2. Figures 2.2-1 and 2.2-7 identify the location of the Transbay Terminal component, Figures 2.2-9 through 2.2-2*1* identify the Caltrain Downtown Extension alignment, and Figure 2.2-2*2* identifies the locations of Redevelopment properties.

### 4.16.3 Historic Architectural Area of Potential Effects

*An* APE for historic architectural resources was also delineated by FTA in consultation with the State Historic Preservation Officer (SHPO). The APE was defined to take into account the potential impacts associated with different project components. The APE also overlaps with several previous investigations. One previous survey, by architectural historian Michael Corbett, was conducted for an earlier proposal for the Caltrain portion of this project. The major difference between the present APE and the Corbett survey area is the inclusion of more buildings and structures at the west side of Second Street from Brannan to Folsom Streets, as well as both sides of Second Street between Folsom Street and roughly Natoma Street.

### 4.16.4 Historic Properties Survey Report

A Historic Architectural Survey Report (HASR) and Historic Property Survey Report (HPSR), which identify and summarize potentially eligible historic and cultural resources within the APE, were prepared and submitted to the SHPO. The SHPO concurred in the determinations of eligibility on May 23, 2002. A copy of the SHPO's letter of concurrence is included in Appendix D. The following sections summarize information and National Register eligibility determinations contained in the HASR and HPSR; they also include available information regarding designations and eligibility at the local and State level.

### 4.16.5 Archaeological Resources

Research for archaeological resources was conducted in 2001, and included review of historical maps and written sources, and a review of archaeological and historic site listings from the Historical Resources Information System Northwest Information Center at Sonoma State

University. There have been a relatively large number of archaeological studies conducted in the project vicinity in the past decade, including Caltrans' SF-480 Terminal Separation Rebuild Project (1993), the City of San Francisco's Alternatives to Replacement of the Embarcadero Freeway and the Terminal Separator Project (1995), and the Peninsula Corridor JPB's Archaeological Resources Investigations of the Caltrain San Francisco Downtown Extension Project (1996). These studies and others were reviewed as part of the current study. An Archeological Report (AR) was prepared in support of the HPSR.

The entire APE is covered by buildings and pavement, and the precise location, integrity and research potential of any archaeological resources that are present cannot be determined without subsurface excavation. The significance of an archaeological site is typically based on its potential to provide information important in prehistory or history, not on any intrinsic value in terms of style, materials, form of construction, or association with specific persons or events. Archaeological resources encountered before or during project construction would be evaluated in accordance with an Archaeological Research Design and Treatment Plan as described in Chapter 5.

#### 4.16.5.1 Prehistoric Archaeology

Although five prehistoric archaeological sites have been recorded within approximately one mile of the APE, no known prehistoric archaeological sites are documented within the APE. Unidentified sites may exist, and it is possible to predict in general terms where such sites are likely to occur on the basis of prehistoric-period landscapes.

Prehistoric archaeological remains in the APE may include, but are not limited to, lithic materials, shells and bone beads, bone tools, heat-altered rock, dietary remains, locally darkened soil (midden), and micro-constituents (e.g., charcoal or fish remains). These remains are likely to be contained within two general property types: residential and non-residential sites. Both types may be eligible for listing in the NRHP.

Although it is impossible to determine where important archaeological remains are located without extensive fieldwork, it is possible to make general statements about the relative archaeological sensitivity of the project area. Because the proposed Transbay Redevelopment Area has the same prehistoric dune sand and bay margin environment as the location of a known prehistoric archaeological site, it is considered to have very high archaeological sensitivity. Geologic investigations conducted for the San Francisco-Oakland Bay Bridge Project indicate that Holocene-age deposits are present west of Second Street, and that these terrestrial landform deposits have a maximum thickness of nearly eight meters (25 feet) and may extend to a maximum depth of approximately 15 meters (50 feet). These deposits are less than 10,000 years old, which is within the range of known human occupation in California. The area along Second Street therefore has high archaeological sensitivity for prehistoric sites. More research is necessary for the area along Townsend Street, which appears to be under the former Mission Bay. If similar results are forthcoming, these deeply buried deposits may contain prehistoric

sites. For purposes of the present study, the entire length of the tunnel alignment can be considered highly sensitive for prehistoric architectural resources.

### 4.16.5.2 Historic Archaeology

Nineteen known or potential historic-era archaeological sites have been identified within or immediately adjacent to the project alternative alignments. Cultural remains from historic periods are likely to occur within the APE, and historic periods within the study area have been defined as follows: Spanish Period, 1769-1822; Mexican Period, 1822-1848; Early American Period, 1848-1868; the Metropolis of the West/Southern Pacific Railroad Era, 1868-1906; and Post-Earthquake San Francisco, 1906-1950. Historical research suggests that examples of the following historic-period archaeological types may be present within the project area:

- Domestic occupation sites –May consist of hollow features (wells, cisterns, garbage pits) and may occur in association with residences, schools, or other places where people lived.
- Domestic architecture – The remains of residences and domestic outbuildings.
- Commercial sites – Refuse caches and sheet deposits of refuse and fill, similar to resource types that occur on domestic sites, may also be expected on commercial sites.
- Institutional sites – These sites represent organizations established to promote a certain objective, and include schools, hospitals, asylums, prisons, churches, etc.
- Industrial Structures/Architecture – Archaeological remains of buildings and structures that housed or aided various industrial processes.
- Industrial features – Evidence of industrial processes themselves, as distinct from the buildings in which these processes were housed.
- Storage yards and warehouses – Storage facilities are unlikely to be NRHP-eligible themselves, but may protect earlier cultural strata that do have research potential.
- Buried ships – Remains of abandoned sailing vessels may have been left in the former Yerba Buena Cove when the cove was filled.
- Wharves – Archaeological remains of projecting wharves may be present on portions of the project area that straddled the shoreline at one time.
- Landfills – Both purposeful and inadvertent fill may be present.
- Gold Rush Period Sites – the scarcity of sites in San Francisco from the 1849-1853 Gold Rush era, and the subsequent depression (1853-1859) make any such deposit potentially eligible to the NRHP, as are historic sites that pre-date the Gold Rush.

Areas of high historic archaeological sensitivity include the Transbay Redevelopment Area, the Second-to-Main Alternative alignment, and the Second-to-Mission Alternative alignment – particularly those portions that are not within historic roadways. Portions of the alternative alignments that pass under existing/historic roadways – for example Second and Townsend Streets – are likely to be less sensitive than where the project crosses historically developed blocks.

### 4.16.6 Historic Architectural Resources

A Historic Architectural Survey Report (HASR) was prepared for this project and is summarized herein. Historical surveys that have previously been conducted in the vicinity of the proposed project were compiled and then supplemented with original field surveys and research where necessary. These previous studies include: Caltrans' San Francisco Bay Bridge Request for Determination of Eligibility (1983), Caltrans' I-280 Transfer Concept Program (1983), the City of San Francisco's South End Historic District (1990), the Embarcadero Freeway and Terminal Separator Structure HASR (1994), the Caltrain Downtown Extension HPSR (1996), and the National Register Nomination for Second and Howard Historic District (1999). The compilation of existing inventories, as well as original research and field investigations were conducted in 2001. Research was performed in various records of the San Francisco Planning Department, and information was also collected from the San Francisco Architectural Heritage (SFAH), the San Francisco Public Library, the California State Library in San Francisco, and at the Sacramento Public Library. A record search was conducted at the Northwest Information Center (at Sonoma State University), and the results of the record search were confirmed and updated.

*There are more than 120 buildings within the APE.* Of these, 85 were evaluated for eligibility for listing on the National Register of Historic Places (NRHP) because they were built in 1956 or earlier. As a result of this and previous studies, 39 of these properties have been determined eligible or appear to be eligible for listing on the *NRHP either individually or as a contributor to a historic property or district.* These properties are presented in Table 4.16-1 and are subject to Section 106 procedures and consultation described in the regulatory framework discussion above. Detailed descriptions for all potentially eligible properties are provided in the HASR. Chapter 5 of this EIS/EIR provides a description of each eligible *property* that would be affected by the proposed project.

Table 4.16-1 also shows the historic status assigned by the City and County of San Francisco Planning Department. If the resource is listed in Article 10, the table indicates whether the structure is a City Landmark, or, if the building is located in one of the City-designated historic districts such as the South End, the table indicates if the building is considered *contributing* (C), *contributing*-altered (CA), or non-*contributing* (NC). Resources that have historic status under Article 11 could be located within the boundaries of a City-designated historic Conservation District such as the New Montgomery-Second Street. These resources are classified into one of five categories. Categories I and II are considered significant buildings, while Categories *III* and IV are designated as *Contributing* Buildings. Category V buildings are neither significant nor *contributing* and are considered unrated.

**Table 4.16-1: Historic Architectural Properties within the APE Listed on, or Determined Eligible for, the National Register**

| *Building Address, Assessors Parcel No., or Bridge No.* | *Date Constructed* | *NR Status* | *City Status (if any)* | *Notes* |
|---|---|---|---|---|
| ***Properties in the Transbay Terminal Area*** | | | | |
| *Upper Deck Approaches Bridge #34-116F* | *1936* | *1* | | *The SF-Oakland Bay Bridge, its approach structures, bus ramps (loop), and other elements were listed on the National Register of Historic Places on August 13, 2001.* |
| *Upper Deck Approaches Bridge #34-118L* | *1936* | *1* | | |
| *Upper Deck Approaches Bridge #34-118R* | *1936* | *1* | | |
| *Transbay Terminal Loop ramp #34-119Y* | *1936* | *1* | | |
| *Harrison Street Overcrossing #34-120Y* | *1936* | *1* | | |
| *425 Mission Street (Transbay Terminal) 3719-003, 3720-001, 3721-006* | *1939* | *1* | | *The Transbay Terminal is a contributing element of the SF-Oakland Bay Bridge, which was listed on the National Register of Historic Places on August 13, 2001* |
| ***Properties in the Second and Howard Streets Area*** | | | | |
| *149 Second Street 3721-049* | *1908* | *1D* | *Article 11 Category IV* | *These six buildings located on Second and Howard Streets are contributing elements of the Second and Howard Streets District, which was listed on the National Register in 1999.* |
| *163 Second Street 3721-048* | *1907* | *1D* | *Article 11 Category IV* | |
| *165-173 Second Street 3721-025* | *1906* | *1D* | *Article 11 Category IV* | |
| *191 Second Street 3721-022* | *1907* | *1D* | *Article 11 Category V* | |
| *580-586 Howard Street 3721-092 through 106* | *1906* | *1D* | | *The four buildings with addresses on Second Street are also located within the City of San Francisco's New Montgomery-Second Street Conservation District. (The two buildings with Howard Street addresses are located outside the conservation district boundaries.)* |
| *589-91 Howard Street 3736-098* | *1906-1907* | *1D* | *Article 11 Category V* | |

**Table 4.16-1: Historic Architectural Properties within the APE Listed on, or Determined Eligible for, the National Register**

| *Building Address, Assessors Parcel No., or Bridge No.* | *Date Constructed* | *NR Status* | *City Status (if any)* | *Notes* |
|---|---|---|---|---|
| *Properties in the Second and Townsend Streets Area* | | | | |
| *301-21 Brannan Street 3788-037* | *1909* | *3D* | *C* | *Unless otherwise noted, the buildings on Brannan, Second, South Park, and Townsend Streets are contributing elements of the Rincon Point/South Beach Historic Warehouse-Industrial District. This district was found to appear to be eligible for the National Register through a 1983 survey conducted by Caltrans. In those cases where OHP has concurred with those findings, the NRHP status is "2."*<br>*All of these buildings are also located within the City of San Francisco's South End Historic District, established in 1990.* |
| *461-67 Second St. 3764-071 through 197* | *1909-38* | *2D2* | *C* | |
| *500 Second Street 3775-001* | *1909* | *3D* | *C* | |
| *512 Second Street 3775-002* | *1909* | *3D* | *C* | |
| *522-524 Second Street 3775-004* | *1923* | *3D* | *C* | |
| *525 Second Street 3774-123 through 132* | *1906* | *3D* | *C* | |
| *543-545 Second Street 3774-064 and 065* | *1907* | *3D* | *NC* | |
| *544 Second Street 3775-005* | *1922* | *3D* | *C* | |
| *555-559 Second Street 3774-045* | *1913* | *3D* | *C* | |
| *563 Second Street 3774-044* | *1907* | *3D* | *C* | |
| *580 Second Street 3775-008* | *1912* | *3D* | *C* | |
| *599 Second Street 3774-031* | *1923* | *3D* | *C* | |
| *601-15 Second Street 3789-008* | *1909* | *3D* | *C* | |
| *625-35 Second Street 3789-007* | *1905* | *2D2* | *C* | |
| *634 Second Street (aka 35 Stanford Court) 3788-038* | *1920* | *3D* | *C* | |
| *640 Second Street 3788-002* | *1926* | *2S2* | *C* | |
| *650 Second Street 3788-049 through 073* | *1922* | *2S2* | *C* | |
| *670-80 Second Street 3788-043, 3788-044* | *1913* | *2S2 (670), 3D (680)* | *C* | |
| *1 South Park 3775-007* | *1910* | *3D* | *C* | |

**Table 4.16-1: Historic Architectural Properties within the APE Listed on, or Determined Eligible for, the National Register**

| *Building Address, Assessors Parcel No., or Bridge No.* | *Date Constructed* | *NR Status* | *City Status (if any)* | *Notes* |
|---|---|---|---|---|
| *130 Townsend Street 3788-008* | *1910* | *3D* | *CA* | |
| *136 Townsend Street 3788-009* | *1902* | *3D* | *C* | |
| *144-46 Townsend Street 3788-009A* | *1922* | *3D* | *C* | |
| *148-54 Townsend Street 3788-010* | *1922* | *3D* | *C* | |
| *162-164 Townsend Street 3788-081* | *1919* | *3D* | *C* | |
| *166-78 Townsend Street 3788-012* | *1910* | *3D* | *C* | |
| *180 Townsend Street 3788-013* | *1921* | *3D* | | |
| *350-60 Townsend Street 3786-015* | *1906* | *2S2* | | *This building is individually eligible for the NRHP.* |

**Notes:** National Register Status codes are as follows:

1D – Listed on the National Register as a contributor to a district or multi-resource property.
1S -- Separately Listed on the National Register.
2 – Determined eligible for National Register in a formal process.
2S1 -- Determined Eligible for Listing by the Keeper of the Register.
2S2 -- Determined Eligible for Listing by Consensus of the SHPO and a Federal Agency.
2D2 – Determined eligible as a contributor by consensus determination.
3D -- Contributor to a District that Appears Eligible. SHPO has yet to concur.

### 4.16.6.1 Transbay Terminal

The Transbay Terminal at 425 Mission Street occupies land extending from Mission Street on the north to Natoma Street on the south. The terminal building crosses Fremont Street on the east and First Street on the west. It is an 870-foot long flat slab with a 230-foot long central pavilion. The construction is reinforced concrete faced with California granite. Designed by Timothy Pfleuger, Arthur Brown, Jr., and John J. Donovan, consulting architects, and built in 1939, the Transbay Terminal was the functional successor to the Ferry Building. When electric trains began arriving over the Bay Bridge, use of the Ferry Building dropped to almost nothing overnight, and the Transbay Terminal took over as the primary gateway to the city[4].

[4] Caltrans, 1995.

*Caltrans reports identify the introduction of electric train services on the Bay Bridge as causing the rapid decline in ferry use and the corresponding decline of the Ferry Building as a transportation hub. In addition, there was also a modal shift from public transit to private automobile use with the opening of the Bay and Golden Gate Bridges, which also contributed to the almost total loss of ferry patronage. During this era, the Transbay Terminal became the primary transit gateway into the city.*

*It should be noted that as congestion on the Bay and Golden Gate Bridges has increased, the Ferry Building reclaimed some of its historic importance as a transportation terminal. Current plans anticipate 33,000 to 40,000 weekday daily passengers on commuter ferry boats by 2020. (Water Transit Authority Implementation and Operations Plan, Section 2).*

*The Transbay Terminal is a contributing element of the San Francisco - Oakland Bay Bridge, which was listed in the NRHP in August 2001.* Its present owner is the California Department of Transportation. Its current use is for commuter and inter- and intra-regional bus transportation.

The Transbay Terminal retains integrity with respect to exterior elevations, areas, and building materials; configuration of interior space; site; and the ramps that connect the building to the San Francisco - Oakland Bay Bridge. (The loop ramp is a component of the Bay Bridge, and it retains integrity as a bridge-related element.) The terminal building has remained in transportation use since it was constructed. Losses and compromises of integrity have occurred with modernization of elements such as doors, the new Greyhound passenger facility, and building materials; and seismic retrofit of various components to meet current earthquake safety standards.[5] The terminal requires substantial additional reconstruction to meet building and seismic codes and standards.

### 4.16.6.2 Transbay Terminal Loop Ramp

The Transbay Terminal Ramp structure consists of a 3,439-foot loop ramp connecting the San Francisco - Oakland Bay Bridge west span with the Transbay Terminal building. The loop ramp constitutes two of the six approach spans that remain from the original Bay Bridge project.[6] It is constructed of riveted steel girders on concrete and steel bents. A concrete slab and box girder bridge on slab wall piers carries the Transbay Terminal Ramp over Harrison Street. This loop ramp was originally designed to carry trolley trains from the bridge to the terminal; the tracks were removed as electrified trains gave way to buses in the late 1950s. The terminal loop ramp currently serves bus traffic exclusively and is used for midday storage of transit buses. It is a contributing element of the San Francisco - Oakland Bay Bridge *property, which is listed on the NRHP.*

[5] Caltrans, 1995.

[6] Caltrans, 1983.

### 4.16.6.3 Rincon Point/South Beach Historic Industrial Warehouse District

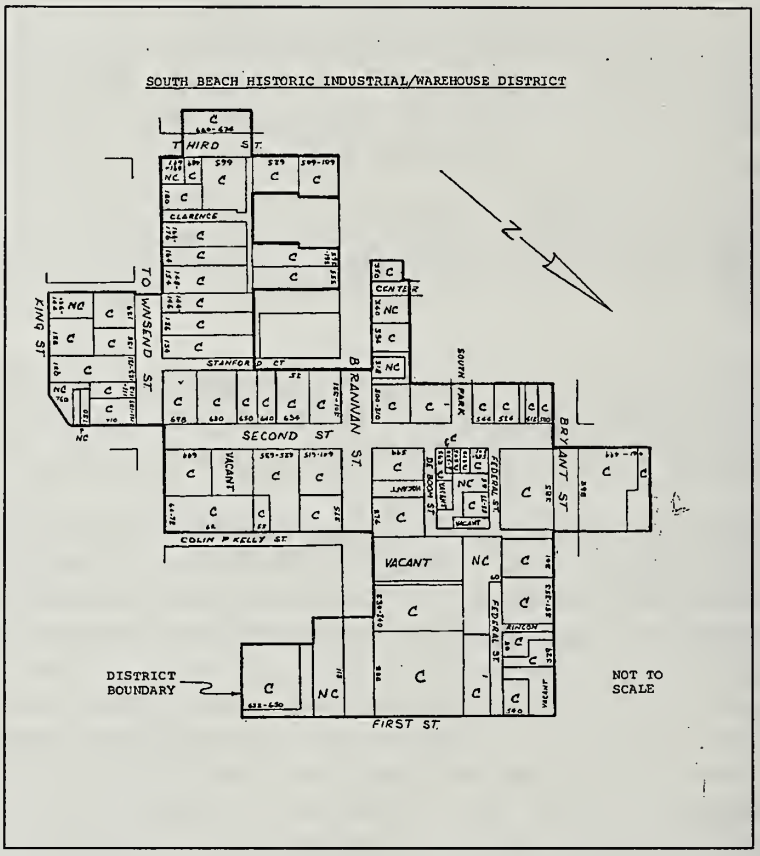
The Rincon Point/South Beach Historic Warehouse Industrial District is a NRHP-eligible district that was developed beginning in the 1850s and 1860s, when landfill efforts and warehouse construction changed the physical appearance of the "point" and "beach" forever. This district contains the greatest concentration of *historic* architectural resources within the project vicinity. The district was identified as appearing eligible for the National Register in 1983, based on research completed by Caltrans historians for the I-280 Transfer Concept Project. That research found that the district appeared eligible under all four National Register criteria. About 60 buildings within the district have been identified as contributing to the district's significance. About eight of these buildings date from before the 1906 earthquake, with several from the mid-1800s. The OHP Historic Property Data File shows a determination of eligibility for the district dated March 19, 1997 (suggesting that OHP has concurred with Caltrans eligibility finding); however, most of the individual buildings are still shown simply as "appears eligible," or NRHP status.

The 1983 inventory and evaluation form states that the district appeared to be eligible under National Register criteria A, B, C, and D, at the state level of significance. The following is an excerpt from the significance statement included on that form:

> Development of the Rincon Point/South Beach area began in the 1850s and 1860s as an answer to economic pressures resulting from the Gold Rush. As sea trade expanded and San Francisco developed into the leading port on the West Coast, both areas developed to serve warehousing needs of the burgeoning state. During the Civil War, the mining riches of the Sierra Nevada and Comstock were handled through the port to help fund the Union cause. The same area saw great numbers of Chinese enter California, seeking employment in the new land. After the turn of the century and following the 1906 earthquake and fire which devastated large areas of San Francisco, the Rincon Point/South Beach areas became mixed in nature: apartments and hotels appeared among the family businesses, light industry and more traditional warehouses. As a result of efforts to improve the appearance of the port for the 1915 Panama Pacific International Exposition, Mediterranean style pier bulkheads were erected to provide a formal entrance from the Bay to the city.
>
> By the end of the 1860s, increased landfill activities had seen streets cut and graded and hills leveled to provide shoreline fill. Steamboat Point, adjacent to South Beach, was filled until it precluded further shipbuilding activities there, and South Beach also began to develop as a warehousing district. Early facilities included the San Francisco and Pacific Gas Company at Second and King Streets, and the Pacific Mail Steam Ship Company, this latter including warehouses, shops and wharves. Still standing today is one of the company's warehouses, the Oriental (1867). Though the Oriental Warehouse's associated dock no longer exists, this building remains important in history as San Francisco's reputed principal shipping point for Sierra Nevada and Comstock gold, and as the point of entry for large numbers of Chinese.
>
> Construction of a new seawall during the period 1878 to 1924 permitted further development of warehouses, dry docks, shipyards and other industries in this area, as a readily accessible outlet to ocean and coastal shipping was provided. Evidence of the period of development from 1880

to 1915 may still be seen, though many of the warehouses from this period have been destroyed. Those remaining structures, however, still afford a picture of the area's general appearance during this important period. Rebuilding activities following the 1906 earthquake and fire altered the character of the area somewhat with the inclusion of hotels and apartments, though re-establishing warehousing and light industrial activities.[7]

The Rincon Point/South Beach Historic Warehouse-Industrial District, as well as other resources within the APE, have been designated locally and/or are eligible for or listed on the California Register of Historic Resources.[8]




[7] John Snyder, "Rincon Point/South Beach Historic Warehouse-Industrial District," Caltrans Architectural Inventory/Evaluation Form, prepared July 22, 1983, copy on file with Northwest Information Center, Sonoma State University.

[8] The California Register of Historic Resources was created in 1992 (AB 2881, Frazee), and Section 5024.1 of the Public Resources Code states that the California Register shall include "California properties formally determined eligible for, or listed in, the National Register of Historic Resources," State Historical Landmarks No. 770 and higher, as well as other State Historical Landmarks and Points of historical interest reviewed and included by the State Historical Resources Commission, and may include other resources of specified types, "if nominated for listing . . . and determined to be significant by the Commission," and resources listed as significant in historical resource survey under certain conditions.

### 4.16.6.4 New Montgomery-Second Street Conservation District (City of San Francisco)

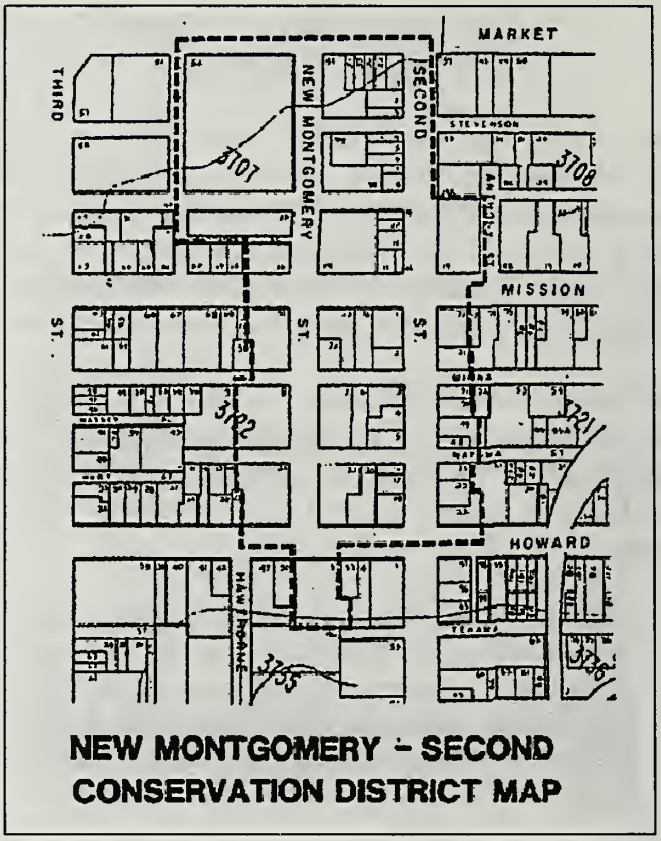
The Board of Supervisors of the City and County of San Francisco approved the formation of the New Montgomery-Second Street Conservation District in 1985, because the area "possesses concentrations of buildings that together create a sub-area of architectural and environmental quality and importance which contributes to the beauty and attractiveness of the City."[9] The location and boundaries of the New Montgomery-Second Street Conservation District were established on a map filed with the Clerk of the Board of Supervisors at that time.[10]

The characteristics of the New Montgomery-Second Street Conservation District that justify this designation include its history, architectural character, and visual and functional unity. The Planning Department also recognized the district's dynamic continuity and the benefits it offers to the city in general as well as to residents. The following is an excerpt from Appendix F, Article 11, San Francisco City Planning Code:

> **History of the District.** This corridor forms one of the earliest attempts to extend the uses of the financial and retail districts to the South of Market area. Since Montgomery Street was the most important commercial street in the 1870's, New Montgomery Street was planned as a southern extension from Market Street to the Bay. Opposition from landowners south of Howard Street, however, prevented the street from reaching its original bayside destination. William Ralston, who was instrumental in the development of the new street, built the Grand Hotel and later the Palace Hotel at its Market Street intersection. A wall of large hotels on Market Street actually hindered the growth of New Montgomery Street and few retail stores and offices ventured south of Market Street. The unusually wide width of Market Street acted as a barrier between areas to the north and south for many years.
>
> A small number of office buildings were built on New Montgomery Street as far south as Atom Alley (now Natoma Street) after the fire. Many buildings were completed in 1907, and most of the street assumed its present character by 1914. At 74 New Montgomery Street, the Call newspaper established its first headquarters. A noteworthy addition to the streetscape was the Pacific Telephone and Telegraph Building. At the time of its completion in 1925, it was the largest building on the West Coast devoted to the exclusive use of one firm. Until the 1960's, the office district on New Montgomery Street was the furthest extension of the financial district into the South of Market area. More characteristic were warehouses and businesses that supported the nearby office district. For example, the Furniture Exchange at the northwest corner of New Montgomery and Howard Streets, completed in 1920, was oriented to other wholesale and showroom uses along Howard Street.

[9] Added Ord. 414-85, App. 9/17/85. See Section 1103 of Article 11, San Francisco City Planning Code.
[10] Map under File 223-84-4, Added Ord. 414-85, App. 9/17/85.

One block to the east, Second Street had a different history from New Montgomery Street. The future of Second Street as an extension of the downtown depended upon the southward extension of the street through the hill south of Howard Street. At one time there was even a proposal to extend Second Street north in order to connect with Montgomery Street. The decision to extend Montgomery Street south rather than Second Street north due to the high cost of the Second Street Cut, however, discouraged retail and office growth on the street. As a result, by the 1880's Second Street was established as a wholesaling rather than retail or office area. In the 1920's, Second Street contained a wide mixture of office support services. These included printers, binderies, a saddlery, a wholesale pharmaceutical outlet, and a variety of other retail stores and smaller offices. Industrial uses were commonly located on the alleyways such as Minna and Natoma and on Second Street, south of Howard Street.




**Basic Nature of the District.** New Montgomery Street is characterized by large buildings that often occupy an entire section of a block defined by streets and alleys or a major portion of these sub-blocks. The buildings are of a variety of heights, but the heights of most of the buildings range from five to eight stories. Second Street is characterized by smaller, less architecturally significant buildings, but, because of their continuous streetwall, they form a more coherent streetscape. Without some sort of protection for the less significant buildings, the quality of the district would be lost due to pressure from the expanding office core.

**Architectural Character.** Although the scale and size of the structures on New Montgomery Street are somewhat monumental, the area remains attractive for pedestrians. The street has a number of outstanding buildings concentrated on New Montgomery, such as the Palace Hotel, the Pacific Telephone tower, and the Sharon Building. The styles range from the Gothic skyscraper massing and Art Deco detailing of the Pacific Telephone and Telegraph Building to the Renaissance Palazzo style of the Palace Hotel. The primary building materials are earth tone bricks, stone or terra cotta, with ornamental details executed in a variety of materials including terra cotta, metal, stucco and stone.

Second Street has a smaller, more intimate scale. While on New Montgomery Street, buildings typically occupy an entire subblock, on Second Street, three or four small

buildings will occupy the same area. The buildings are generally mixed-use office and retail structures, three to five stories in height, with Renaissance-influenced ornament.

The two streets are unified by several elements, including an architectural vocabulary that draws from similar historical sources, similar materials, scale, fenestration, color, stylistic origins, texture, and ornament.

**Uniqueness and Location.** The District is located close to the central core of the financial district and is adjacent to an area projected for the future expansion. It is one of the few architecturally significant areas remaining largely intact in the South of Market area.

**Visual and Functional Unity.** The District has a varied character ranging from the small and intimate on the alley streets to a more monumental scale on New Montgomery. In spite of this wide range, the district forms a coherent entity due to the buildings' common architectural vocabulary and the rhythm of building masses created by the District's intersecting alleys.

**Dynamic Continuity.** The District is an active part of the downtown area, and after some years of neglect is undergoing reinvestment, which is visible in the rehabilitation of the Pacific Telephone Building, and the repair and rehabilitation of other buildings in the District.

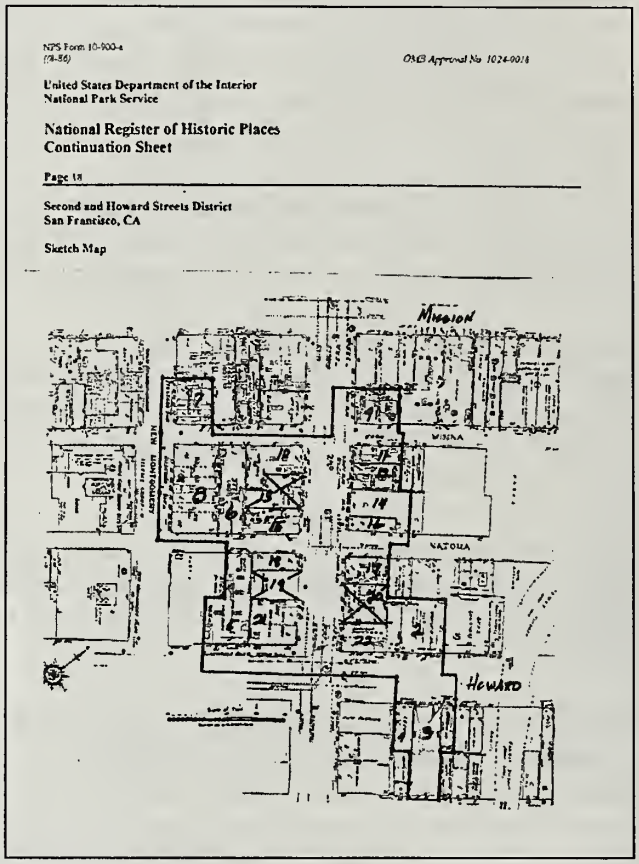
**Benefits to the City and Its Residents.** The District is a microcosm of twentieth century commercial architecture, ranging from low-level speculative office blocks to the City's premier hotels and executive offices of the time. The District now houses a variety of uses from inexpensive restaurants and support commercial uses, such as printers, to executive offices. The area retains a comfortable human scale, which will become increasingly important as neighboring areas of the South of Market become more densely developed. [11]

### 4.16.6.5 Second and Howard Streets District (National Register of Historic Places)

The Second and Howard Streets District is a National Register historic district that is almost entirely surrounded by the City of San Francisco's New Montgomery-Second Street Conservation District. The Second and Howard Streets District was evaluated in 1998 by Anne Bloomfield. Ms. Bloomfield submitted a *NHRP* Registration Form for the district to the California Office of Historic Preservation (OHP) in October 1998, OHP certified the district in June 1999, and the district was listed on the *NRHP* on July 28, 1999.[12]

[11] Added Ord. 414-85, App. 9/17/85. See, San Francisco City Planning Code, Article 11, Appendix F, http://www.ci.sf.ca.us/planning/.

[12] Anne Bloomfield, "Second and Howard Streets District," National Register of Historic Places Registration Form, prepared October 3, 1998, certified June 15, 1999, copy on file with Northwest Information Center, Sonoma State University; NPS, National Register Information System (NRIS), "Second and Howard Streets District," listing date July 28, 1999, as accessed at http://www.cr.nps.gov/nr/research/nris.htm.


NPS Form 10-900-a
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OMB Approval No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places
Continuation Sheet

Page 18

Second and Howard Streets District
San Francisco, CA

Sketch Map



The Second and Howard Streets District has been determined eligible for the National Register of Historic Places at the local level of significance, under Criterion C, architecture, in the context of San Francisco's rebuilding after the great earthquake and fire of 1906. The district has a remarkable continuity of building type, scale, and style. Over 90 percent of the buildings contribute to the feeling of a district. All the contributing buildings were constructed [between] 1906 and 1912, the district's period of significance. All are masonry structures, half of them clad in brick, two in terra cotta (now painted), and the rest in stucco. All are Commercial Style with limited Renaissance-Baroque ornament. Ground floors are commercial and therefore, by design and practice, frequently altered to suit commercial needs. Upper floors most often are lofts. The area was built principally for services to the construction industry, perhaps the reason why it was built up so quickly after the 1906 earthquake and fire. The scale and modesty of the buildings demonstrates their intended uses as different from the city's main office sector to the north crossing Mission and Market Streets and to the west along New Montgomery Street. They are also different from the industrial sector to the east and south. Services to the construction industry used to continue westerly from New Montgomery, near the Builders' Exchange, a membership and mail boxes organization that in 1910 was located at 180 Jessie Street west of New Montgomery and Mission Streets. However, hardly any of the buildings housing that part of this service industry still exist. The 1910 classified directory shows the Second and Howard Streets District as headquarters for a plumbing supply house, nine electrical businesses, a terra cotta works (N. Clark & Sons), several engineers, metallurgists, a blueprint service, an asbestos supplier (Johns-Manville), a sheet metal works, chemists, and printers. The area of significance is architecture; significant dates are 1906, 1907, 1908, 1909, and 1912, the years of construction of the various buildings. The two non-contributing buildings [144-54 Second Street and 168 Second Street] have been altered significantly. The district retains a remarkable integrity in contrast to all the city's modern changes.[13]

[13] Anne Bloomfield, "Second and Howard Streets District," National Register of Historic Places Registration Form, prepared October 3, 1998, certified June 15, 1999, copy on file with Northwest Information Center, Sonoma State University.

#### 4.16.6.6 The South End Historic District (City of San Francisco)

The San Francisco Board of Supervisors established the South End Historic District in 1990 because of its "special character and special historical, architectural and aesthetic interest and value [that] constitutes a distinct section of the City."[14] The location and boundaries of the South End Historic District were on a map filed with the Clerk of the Board of Supervisors under File No. 115-90-3.[15] The following is an excerpt from Appendix I, Article 10, San Francisco City Planning Code, beginning with the historic context of the district:

> For decades after the 1849 Gold Rush, San Francisco was the principal seaport and connection with the outside world for California and the West Coast. San Francisco's expansion and transformation into one of the most important cities in North America is attributable to the eminence of its port that, because of its sheltered location and deep water, became one of the best-suited on the Pacific Ocean.
>
> The development of warehouses over a 120-year period along the southern waterfront provides a benchmark from which to view architectural and technological responses to the rapid changes of growing industrial nation state and city. The interdependence of architecture and history can be seen from a look at the evolution of warehouse forms along the southern waterfront. Unlike most other areas of the San Francisco waterfront, the South End district contains an extraordinary concentration of buildings from almost every period of San Francisco's maritime history. Several street fronts—such as Second, Third and Townsend—are characterized by solid walls of brick and reinforced concrete warehouses. With this harmony of scale and materials, the South End Historic District is clearly a visually recognizable place.
>
> One-story warehouses were common in the nineteenth century but rare in the early twentieth due to the increasing cost of land. Two of the oldest warehouses in the historic district are one story in height: Hooper's Warehouse (1874) and the California Warehouse (1882). Their horizontal orientation is accentuated through the use of strong cornice lines with decorative brick patterns. Multi-story buildings have been more common along the southern waterfront since the turn of the century. After 1906, almost all new warehouses were constructed to be at least three stories in height, and several warehouses on Second and Townsend Streets reached six stories. The invention of the forklift in the 1930s eliminated advantages that multi-story buildings enjoyed over single-story structures. Since 1945, almost all warehouses constructed in the United States have been one story in height. Many multi-story warehouses and industrial buildings have been converted to other uses or are vacant because they have become obsolete for most warehouse or industrial functions.

[14] Added by Ord. 104-90, App. 3/23/90. See Section 1001, Article 10, City Planning Code.

[15] Added by Ord. 104-90, App. 3/23/90.

South End's period of historical significance, 1867 to 1935, comprises the era during which the waterfront became a vital part of the city's and nation's maritime commerce. The buildings of the South End Historic District represent a rich and varied cross-section of the prominent local architects and builders of the period. Four buildings remain from the nineteenth century; another four were constructed in the six-year interval preceding the 1906 earthquake. The majority of the buildings were erected between 1906 and 1929, a period during which trade along the waterfront increased dramatically.

The proposed historic district is an important visual landmark for the city as a whole. The large number of intact masonry warehouses which remain to this day are reminders of the maritime and rail activities which helped to make San Francisco a great turn-of-the-century port city. The warehouse district, because of its distinct building forms, is identifiable from many parts of San Francisco and the greater Bay Area.[16]

## 4.17 HAZARDOUS MATERIALS

The proposed project would involve construction within an urbanized area, where hazardous materials/hazardous wastes would be a concern due to past land uses and undocumented releases to the subsurface environment. Potential hazardous materials/waste sources or sites within the project alignment are discussed, along with a summary of data sources consulted.

### 4.17.1 Introduction and Data Sources

Potential areas of contamination that could affect the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project were identified by reviewing previous environmental documents prepared for the Caltrain portion of the project (mainly the 1997 Draft EIS/EIR); reviewing information from regulatory agency databases; walking the alignment to confirm listings in the data base report and making observations at several properties where subsurface work or excavation is currently being conducted; and reviewing results of past investigations in the area.

Review of regulatory agency databases focused on the following: (a) known or potential hazardous waste sites or releases; (b) sites currently under investigation for environmental violations; (c) sites that involve the manufacture, generation, use, storage, and/or disposal of hazardous materials or hazardous waste (owner and tenants); (d) sites with underground storage tanks (USTs), and (e) sites with recorded violations of regulations concerning USTs and hazardous materials/ hazardous wastes. A total of 37 federal, state and local regulatory agency lists were searched to identify listed facilities within the project alignment, including lists maintained by the U.S. Environmental Protection Agency (US EPA), the California

[16] Added by Ord. 104-90, App. 3/23/90. See, San Francisco City Planning Code, Article 10, http://www.ci.sf.ca.us/planning/. Additional historical information may be found in the South End Historic District Case Report No. 89.065L.

Environmental Protection Agency (Cal EPA), the California State Water Resources Control Board (SWRCB), and the Regional Water Quality Control Board (RWQCB).

During the previous 1997 study, Ms. Pamela Hollis, CIH, with the San Francisco Department of Public Health, was consulted to obtain information regarding known Article 20 (known as the Maher Ordinance) investigation sites within the project area. Article 20 was amended in 1999 and is now Article 22A of the San Francisco Public Works Code. Article 20, *which* was originally adopted in 1986, requires historical research and *possibly* subsurface investigation including soil/groundwater sampling at sites bayward of the City's historic (1851) high tide lines if more than 50 cubic yards of material will be excavated or disturbed. This is a requirement for the issuance of a building or construction permit from the City and County of San Francisco.

Existing environmental investigations reports within the project area were also reviewed. Other Relevant environmental investigation reports were identified and reviewed as part of this study.

### 4.17.2 Recorded Hazardous Materials Sites

There are three main sources of potentially hazardous materials within the study area. By far the main source of potentially hazardous material or waste is the fill used to reclaim areas of the Bay along the historic shoreline. Additionally, past industrial land uses and the presence of USTs containing fuel hydrocarbons and other substances are also significant sources of soil and groundwater contamination along the proposed alignment. The proposed project alignment includes a large area of reclaimed bay and tidal areas that lay either along or bayward of the historic shoreline of San Francisco. (See Figure 4.17-1 for the location of fill areas and the historic shoreline.) Materials used to fill the shoreline/tidal areas included general debris (soil, ash, slag, etc.) and sources such as dune sand as well as a large amount of debris from the 1906 earthquake and resulting fire. Fill material from these sources are known to contain elevated concentrations of lead and other heavy metals, polyaromatic hydrocarbons (PAHs), and fuel hydrocarbons. In many areas testing of this material often reveals concentrations of constituents of concern that exceed State or Federal hazardous waste criteria.

Past industrial land uses near the historic shoreline contributed to potential contamination of soil and groundwater along the proposed alignment. These areas were typically chosen for their accessibility from the water and waste disposal practices at that time often included direct discharge to the ground surface or the Bay.

Coal gasification plants (also known as Manufactured Gas Plants (MGPs)) were historically located near Second and Townsend Streets and First and Natoma Streets and are known to have disposed of residual or waste material known as coal tar, directly to the waters of San Francisco Bay prior to some of these areas being reclaimed by filling. The old Yerba Buena Cove was commonly referred to as the "Tar Flats" which described the condition of the cove at low tide from the disposal of coal tar directly to the shallow waters of the cove. During reclamation of the land, fill material was deposited directly on top of the discharged coal tar. As such, this

material is often encountered during excavations in areas near the former MGPs. Additionally, the South of Market area in general contains a high density of USTs, many of which were abandoned, but not removed, which in turn leads to a high occurrence of soil and groundwater contamination by fuel hydrocarbons.

Record reviews identified 39 sites that have the potential to impact subsurface contaminants for the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project. Table 4.17-1 provides a summary of the sites, and site locations are shown in Figure 4.17-1. The main constituents of concern identified in the study area are coal tar residues, lead and other heavy metals, and petroleum hydrocarbons associated with USTs and are discussed briefly below.

#### 4.17.2.1 Coal Tar Residues

Contamination was encountered at several Article 20 investigation sites within the project area, as shown on Figure 4.17-1.

The Oriental Warehouse site located at Delancey and Brannan Streets (Site 12) and a property located at Second and Townsend Streets (Site 13) each have coal tar residues. Historical records indicate one MGP existed near Townsend and Second Streets and another near King and Second Streets. Coal tar was discharged directly into Mission Bay and, in some areas, may have been transported there during filling of the Bay. The areas of the Bay that received the discharges were later filled as reclaimed land. The coal tar deposits from these two plants overlap and together range in thickness from approximately one to five feet and in depth from five to 10 feet below the ground surface. The deposits thin over short distances along Second Street north of Townsend Street but extend laterally to The Embarcadero, Mission Creek (China Basin), and Third Street.

The area in the vicinity of First and Natoma Streets is also the historical location of a MGP where coal tar was discharged to Yerba Buena Cove. Coal tar and coal tar residues have been encountered during investigation and construction of the two high-rise buildings along the southern side of the intersection of Howard and Beale Streets and beneath the foundation of the building on Fremont Street between Howard and Folsom Streets. Coal tar residues have also been detected during investigations conducted as far east as Main Street. Coal tar is known to exist on top of Bay Mud deposits along Beale Street from approximately Mission to Folsom Streets. It has been found as far east as The Embarcadero and is believed to extend as far west as Fremont Street. The thickness of the coal tar deposit ranges from near zero along the fringes of the deposit up to seven to 10 feet in the area of Beale and Howard Streets. The approximate depth to the top of the deposit is 10 to 12 feet at Beale Street, shallowing to the west and deepening to the east, although shallow deposits have been encountered near The Embarcadero at Howard Street. Coal tar residues are believed to be present in soil throughout the entire area of the former Yerba Buena Cove from First Street to The Embarcadero.

**Table 4.17-1**
**Known Hazardous Materials Sites Identified within the Study Area (2)**

| Site No. (1) | Site Name and Location | Agency Database | Nature of Release | Resources Affected | Status | Remedial Actions | EDR Map ID (3) |
|---|---|---|---|---|---|---|---|
| 1 | Federal Reserve Bank, 100 Mission/ Main St | LUST | Gasoline | Not Indicated | Leak being confirmed | No Action Taken | 12 |
| 2 | Talco, Inc., 621 First St | LUST, CORTESE | Diesel | Soil Only | Remediation completed or deemed unnecessary | Excavate & dispose of contaminated soil | 35 |
| 3 | San Francisco Gas Light Co., 401 Howard St. | Coal Gas Sites | Coal Gas | Soil Only | Not Indicated | Not Indicated | 51 |
| 4 | Caltrans (Transbay Terminal), 150 First St. | LUST, CORTESE | Diesel | Not Indicated | Remediation completed or deemed unnecessary | Excavate and dispose of contaminated soil | 29 |
| 5 | San Francisco Gas Light Co., 166 Fremont St., 498 Howard St. | Coal Gas Sites | Coal Gas | Not Indicated | Not Indicated | Not Indicated | 42 |
| 6 | US Marine Corps –Supply Depot, 160 Harrison St. | LUST | Diesel | Soil Only | Case closed | Not Indicated | 68 |
| 7 | 524 Howard St. | LUST, CORTESE | Heater Fluid | Soil Only | Case closed | Excavate and dispose of contaminated soil | 72 |
| 8 | Department of Transportation, 434 Main St | LUST | Diesel | Soil Only | Remediation completed or deemed unnecessary | Not Indicated | 79 |
| 9 | Caltrans, 120 Richards St | LUST, CORTESE | Gasoline | Ground-water | Leak being confirmed | Not Indicated | 79 |
| 10 | Dahl Beck Electric Co., 580 Howard St | LUST, CORTESE | Gasoline | Soil Only | Remediation completed or deemed unnecessary | No Action Taken | 86 |
| 11 | 141 New Montgomery, 171 New Montgomery St. | LUST, CORTESE | Gasoline | Ground-water | Remediation completed or deemed unnecessary | Excavate & dispose of contaminated soil | 91 |
| 12 | Oriental Warehouse, Delancey and Brannan Streets | Not listed | PAHs/ LUST | Soil Only | Not Indicated | Not Indicated | Hollis, 1995 |
| 13 | Unspecified Site, Second and Townsend Streets | Not listed | PAHs/ LUST | Soil Only | Not Indicated | Not Indicated | Hollis, 1995 |
| 14 | Pacific Bell, 611 Folsom St. | LUST, CORTESE, RCRIS | Diesel | Soil Only | Not Indicated | No Action Taken | 108 |
| 15 | 600 Harrison St. | LUST | Gasoline | Soil Only | Remediation completed or deemed unnecessary | Excavate and dispose of contaminated soil | 115 |

**Table 4.17-1**
**Known Hazardous Materials Sites Identified within the Study Area (2)**

| Site No. (1) | Site Name and Location | Agency Database | Nature of Release | Resources Affected | Status | Remedial Actions | EDR Map ID (3) |
|---|---|---|---|---|---|---|---|
| 16 | Photosynthesis LTD Chromeworks, 425 Bryant St. | LUST, CORTESE | Diesel | Soil Only | Not Indicated | No Action Taken | 134 |
| 17 | George Lithograph CO, 650 Second St. | LUST, CORTESE | Gasoline | Not Indicated | Remediation completed or deemed unnecessary | Not Indicated | 143 |
| 18 | San Francisco Fire Dept., 698 Second St. | LUST, CORTESE | Gasoline | Soil Only | Leak being confirmed | No Action Taken | 150 |
| 19 | Commercial Building, 35 Stanford St. | LUST | Gasoline | Soil Only | Not Indicated | Excavate and dispose of contaminated soil | 158 |
| 20 | Commercial, 101 Townsend St. | LUST | Diesel | Soil Only | Remediation completed or deemed unnecessary | Remove free product | 163 |
| 21 | San Francisco Gas & Electric Co., 120 King St. | Coal Gas Sites | Coal Gas | Soil Only | Not Indicated | Not Indicated | 174 |
| 22 | Pacific Gas Improvement Co., 169 Townsend St. | Coal Gas Sites | Coal Gas | Soil Only | Not Indicated | Not Indicated | 177 |
| 23 | McDonalds Corp., 701Third St. | LUST, CORTESE | Gasoline | Ground-water | Remediation completed or deemed unnecessary | Excavate and dispose of contaminated soil | 186 |
| 24 | Sun Chemical Corp.#1, 252 Townsend St | Cal-Sites (Cal-EPA) | Not Indicated | Not Indicated | No Further Action | Not Indicated | 191 |
| 25 | Unspecified Site | Not listed | Metals | Soil Only | Not Indicated | Not Indicated | Dames & Moore, 1990a |
| 26 | San Francisco Iron Foundry, 260 Townsend St. | Cal-Sites (Cal-EPA) | Not Indicated | Not Indicated | Referred to another agency | Not Indicated | 193 |
| 27 | Heublin, Inc., 601 Fourth St. | LUST, CORTESE | Diesel | Ground-water | Leak being confirmed | Not Indicated | 189 |
| 28 | Sun Pacific Imports, 530 Brannan St. | LUST, CORTESE | Gasoline | Ground-water | Remediation completed or deemed unnecessary | Excavate and dispose of contaminated soil | 194 |
| 29 | Commercial Building, 542 Brannan St | LUST | Gasoline | Undefined | No leak action taken after initial report | Excavate and dispose of contaminated soil | 196 |
| 30 | Southern Pacific Trans., 329 Townsend St. | LUST, CORTESE | Diesel | Ground-water | Assessment underway | Excavate & dispose of contaminated soil | 203 |
| 31 | SF Newspaper Agency, 590 Brannan St. | LUST, CORTESE | Gasoline | Ground-water | Cleanup in progress | Remove free product | 201 |

**Table 4.17-1**
**Known Hazardous Materials Sites Identified within the Study Area (2)**

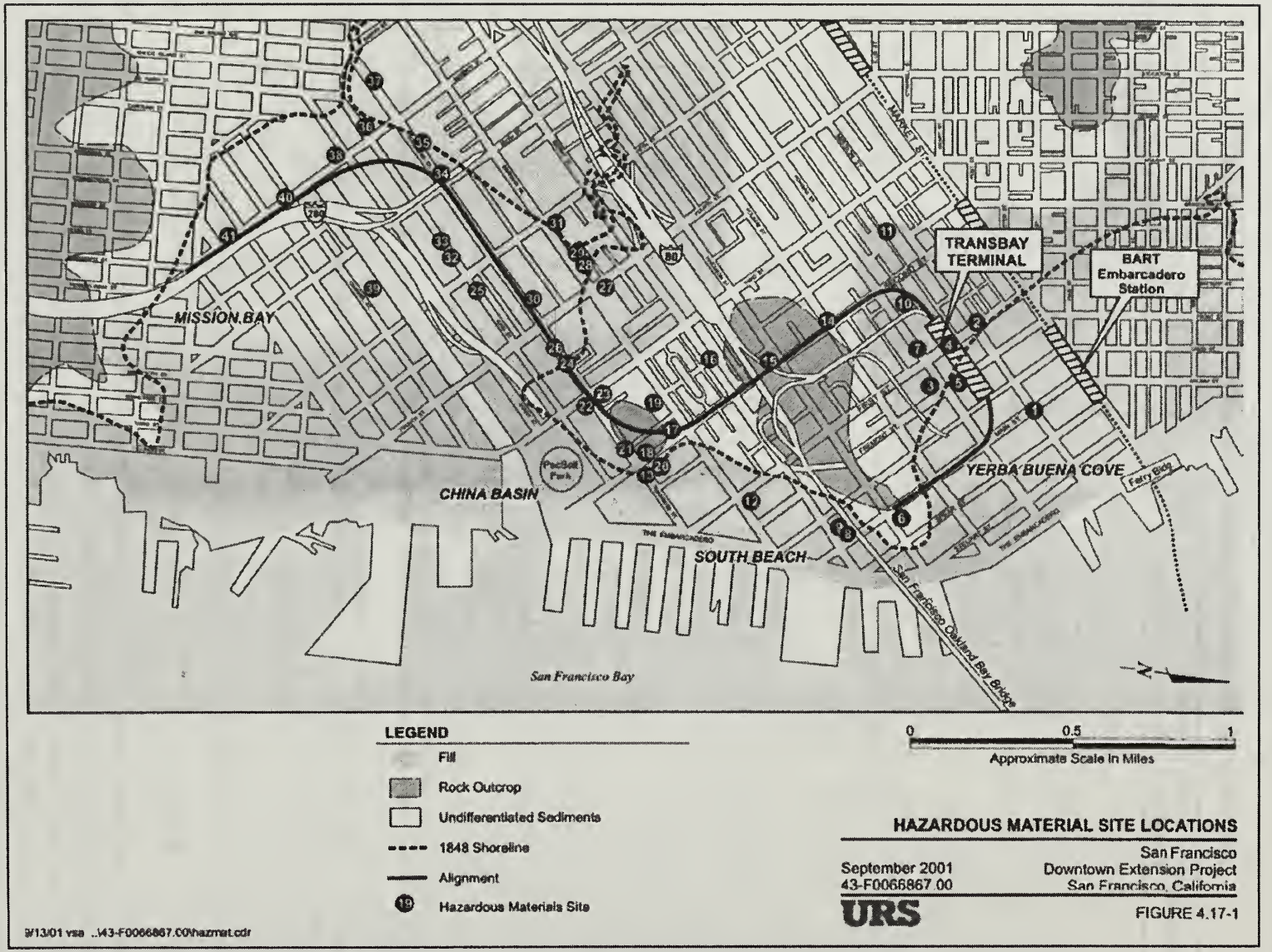
| Site No. (1) | Site Name and Location | Agency Database | Nature of Release | Resources Affected | Status | Remedial Actions | EDR Map ID (3) |
|---|---|---|---|---|---|---|---|
| 32 | Unspecified Site | Not listed | Metals, Petroleum | Soil Only | Not Indicated | Not Indicated | Dames & Moore, 1990a; Mullinix, 1995 |
| 33 | California Poultry Co., 777 Brannan St. | LUST, CORTESE | Gasoline | Ground-water | Leak being confirmed | No Action Taken | 222 |
| 34 | Flair Electro Sales, 516 Townsend St | LUST, Notify 65 | Diesel | Ground-water | Leak being confirmed | No Action Taken | 224 |
| 35 | Independent Electric Supply, 550 Townsend St. | LUST | Gasoline | Ground-water | Pollution Characterization | No Action Taken | 228 |
| 36 | Baker/Hamilton Bldg. 638 King St. | LUST, CORTESE | Gasoline | Soil Only | Remediation completed or deemed unnecessary | No Action Taken | 235 |
| 37 | Baker/Hamilton Properties, LLC, 650 King St. | LUST | Fuel Oils | Soil Only | Remediation underway | Excavate & dispose of contaminated soil | 237 |
| 38 | Golden Gate Disposal Co., 900 7th St. | LUST, FINDS | Motor Oil | Undefined | Leak being confirmed | Excavate & dispose of contaminated soil & remove free product | 238 |
| 39 | Former Southern Pacific Co., 415 Channel St. | LUST | Gasoline | Soil Only | Leak was confirmed | No Action Taken | 240 |
| 40 | Greyhound Bus Depot, 150 Hopper St. | CA FID | None | Not Indicated | Not Indicated | No Action Taken | 242 |
| 41 | The Glidden Co. | LUST | Misc. Fuels & Solvents | Ground-water | Remediation is planned | No Action Taken | Dames & Moore, 2001 |

Notes:
(1) Site numbers correspond to site location numbers shown on Figure 4.17-1.
(2) Information presented in this table is from Environmental Data Resources, Inc. (EDR, 2001); agency correspondence; and Dames & Moore (URS) project files.
(3) EDR Map ID is the ID number as designated in the EDR reports.

**Source:** URS, 2001

### 4.17.2.2 Lead

The historic industrial land uses in the project area and the nature of the fill material placed during land reclamation have resulted in areas where lead concentrations and other heavy metals in soil exceed state and/or federal criteria for hazardous waste determination. For example, soil with lead was encountered during The Embarcadero Roadway and Muni Turnaround projects as well as at recent commercial and residential developments in the South of Market Area. Lead is also associated with old UST sites where leaded gasoline stored in USTs leaked and impacted soil/groundwater.


TRANSBAY TERMINAL
BART Embarcadero Station
MISSION BAY
CHINA BASIN
SOUTH BEACH
YERBA BUENA COVE
San Francisco Bay
San Francisco Oakland Bay Bridge
LEGEND
Fill
Rock Outcrop
Undifferentiated Sediments
1848 Shoreline
Alignment
Hazardous Materials Site
0
0.5
1
Approximate Scale in Miles
HAZARDOUS MATERIAL SITE LOCATIONS
September 2001
43-F0066867.00
San Francisco
Downtown Extension Project
San Francisco, California
URS
FIGURE 4.17-1
9/13/01 vsa ..\43-F0066867.00\hazmat.cdr

#### 4.17.2.3 Underground Storage Tanks

Review of the regulatory agency databases included 29 UST (fuel tanks) release sites within close proximity of the proposed project as shown in Figure 4.17-1 and listed in Table 4.17-1. It is possible that other unidentified USTs may exist in close proximity to the proposed Project. Fuel hydrocarbons (gasoline, diesel, and motor oil), aromatic hydrocarbons (benzene, toluene, ethylbenzene, and xylenes), and lead are the contaminant types most frequently associated with leaking USTs.

## 4.18 VISUAL AND AESTHETIC SETTING

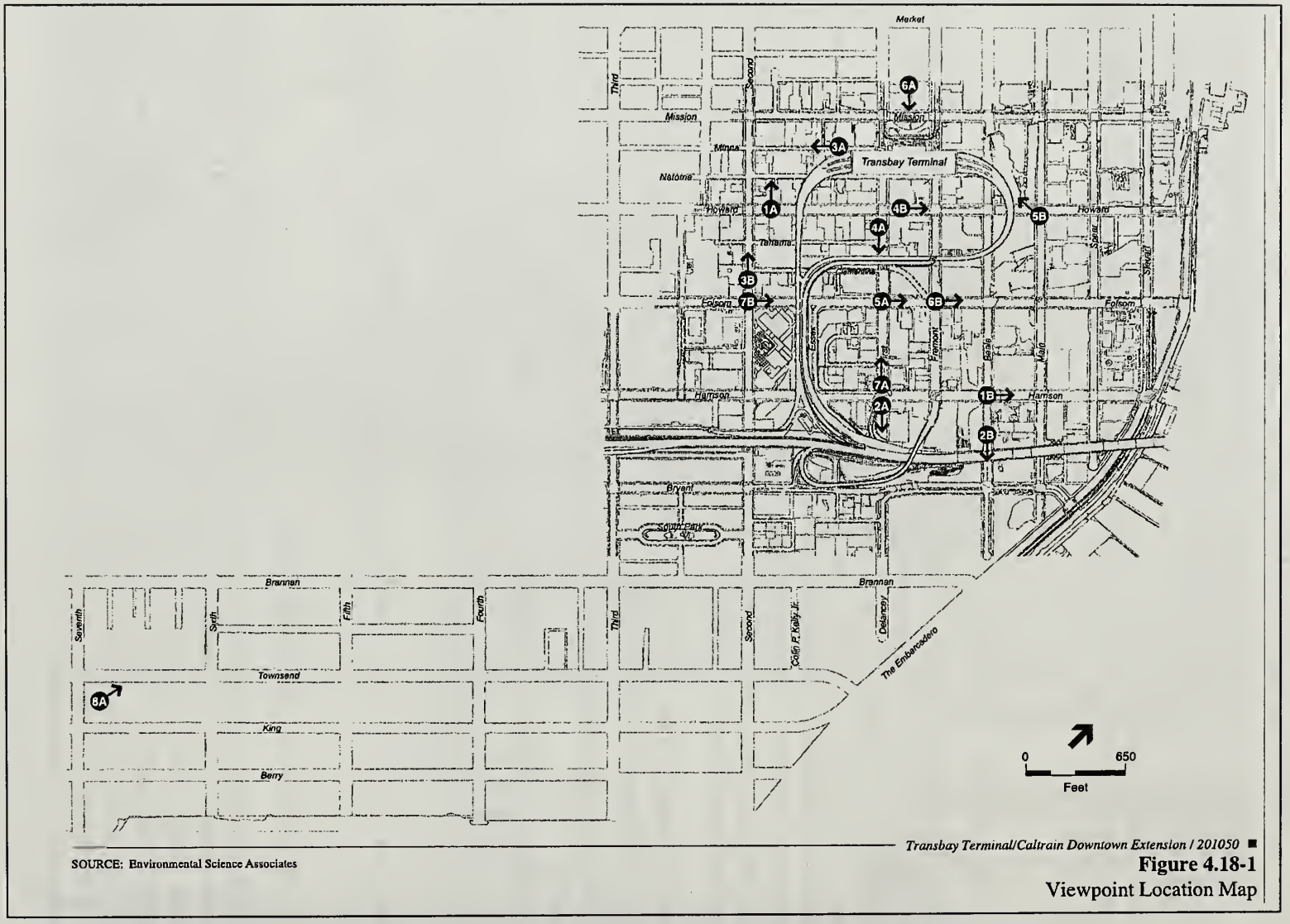
The visual and aesthetic environment in the study area is described below to establish the baseline against which to compare changes resulting from construction of project facilities and the demolition or alteration of existing structures or streetscape elements. This discussion focuses on the vicinity of the existing Transbay Terminal, the proposed Caltrain Downtown Extension and proposed Transbay Redevelopment Area, and associated properties where the project has the potential to change above-ground structures, affecting the visual appearance of the study area and views enjoyed by area users. The existing visual quality of the proposed study area is determined by a number of factors. Important factors include the:

- General "image" of the area that results from its location, its overall form, and the degree of spatial definition provided by its boundaries;
- Visual variety of landscape and architectural resources within the area, in terms of type and quality;
- Availability of public views, including of regional landmarks, within the area; and
- Position of the area in dynamic view sequences, such as entry to San Francisco by water or freeway, in which the area may be an important component of the larger cityscape.

The locations of viewpoints discussed in the following section are shown on Figure 4.18-1.

### 4.18.1 Visual Character of the Area

The visual character of the study area is varied, reflecting changing development patterns and uses over the past 95 years. Its physical character is a combination of low-, mid-, and high-rise buildings, ranging from early 20th century historic structures and districts, to new, single and clustered office towers. A large amount of the Transbay Area is underdeveloped, much of it occupied by surface parking lots. Blocks and streets are punctuated by vehicular overpasses from the highway, the Bay Bridge, related off-ramps, and bus ramps. Low-scale neighborhoods exist in several disparate areas.




*Transbay Terminal/Caltrain Downtown Extension / 201050* ■

SOURCE: Environmental Science Associates

**Figure 4.18-1**
Viewpoint Location Map

The overall Transbay Redevelopment Area does not currently have a high degree of visual definition or coherence. Certain elements provide a formal order, giving the area its general character. The street grid is rectilinear and regular and generally consists of larger blocks typical of South of Market. First Street acts as a seam between two development patterns south of Market Street. This is manifested in block orientation and building type, where the 550-foot by 825-foot blocks generally west of First Street are nearly twice as large as the blocks to the east and nearly four times as large as those north of Market Street. Coupled with the generally low-rise nature of development south of Mission Street and west of Beale Street and the lack of vertical relief north of Rincon Hill, the result is a pattern of small-scale buildings on large-scale blocks.

The northern boundary of the study area is visually defined by Market Street's abrupt transition from the diagonal street grid of the proposed Transbay Redevelopment Area to the alignment of streets to the north,[17] and also by the high-rise structures in the downtown urban core. These structures in aggregate produce a large-scale visual edge that is somewhat relieved by building qualities and exterior architectural treatments on the high-rise buildings (Figure 4.18-2A). The eastern boundary of the study area is also marked by the strong visual contrasts that typically occur at the water's edge: the clarity of the edge itself; vivid changes in forms, texture and color; and a moving open water surface juxtaposed with visual walls (Figure 4.18-2B). The western edge of the study area is less distinct, although the strong identity of Yerba Buena Gardens clearly comes into prominence west of Third Street.

The elevated Bay Bridge approach dominates views in a southerly direction along Rincon Hill, creating a visual boundary in the southern portion of the study area (Figure 4.18-3A). In places, the Bay Bridge Anchorage lacks ornament and formal variation and tends to be absorbed by surrounding structures, except where Rincon Hill falls away and the Beale Street anchorage and bridge steel work take on sculptural qualities (Figure 4.18-3B). South of Bryant Street, mid-rise residential structures and a collection of large-lot, mid-rise warehouses in the South End Historic District and vast expanses of open water of the San Francisco Bay characterize views of the study area's southern edge.

The relative flatness of the proposed Redevelopment Area adjacent to the Rincon Hill Area accentuates those features that do reach above the surrounding landscape. Such features include the Moderne form of the Pacific Telephone Building on New Montgomery Street (Figure 4.18-4A), the most striking element on the western edge of the study area; the Second Street corridor, with new development and contemporary design coexisting with the historic urban fabric (Figure 4.18-4B); and the heavily excavated yet important form of Rincon Hill on the south, with the newly remodeled spire of the Bank of America clock tower accentuating its height (Figure 4.18-5A).

[17] The South of Market street grid is oriented off of true north by approximately 45 degrees. Thus, Mission Street and streets parallel to it run in a southwest-northeast direction and perpendicular streets, such as First Street, run in a northwest-southeast direction. For purposes of this analysis, local convention directions are used. Thus, Mission Street runs in an east-west direction and First Street runs in a north-south direction.

Fig 2A Folsom Street, Near First Street, Looking North to Downtown

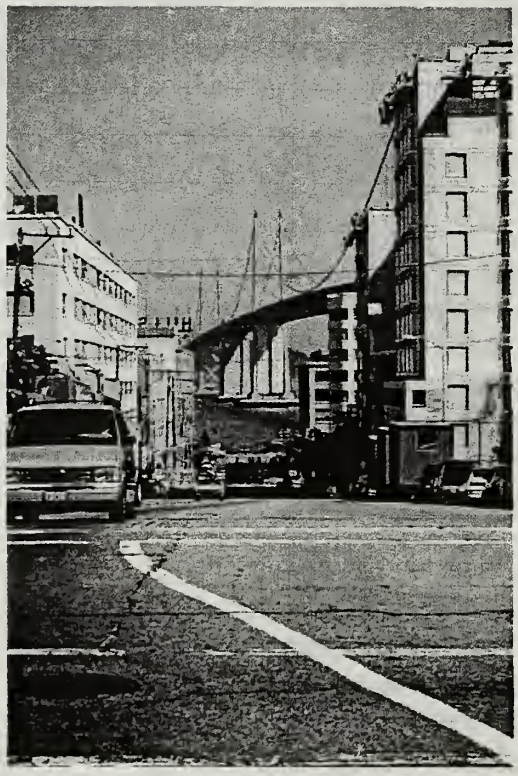


Fig 2B Harrison Street at Beale Street, Looking East to Bay Bridge

SOURCE: Environmental Science Associates
Parsons Transportation Group

*Transbay Terminal/Caltrain Downtown Extension / Redevelopment Project EIS/EIR* ■

**Figure 4.18-2**
**Existing Views**

Fig 3A First Street, Near Harrison Street, Looking South to Elevated Bay Bridge Approach

Fig 3B Main Street, Looking South to Bay Bridge Steel Work

SOURCE Environmental Science Associates
Parsons Transportation Group

*Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project FEIS/EIR* ■

**Figure 4.18-3**
**Existing Views**

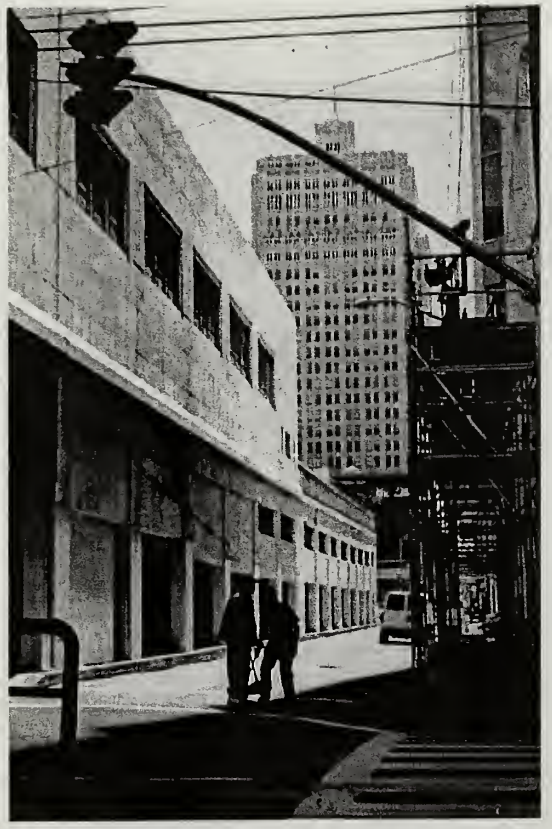


Fig 4A Pacific Telephone Building (New Montgomery Street) from Minna Street

Fig 4B Second Street Corridor, Looking North

SOURCE: Environmental Science Associates
Parsons Transportation Group

*Transbay Terminal/Caltrain Downtown Extension /Redevelopment Project EIS/EIR* ■

**Figure 4.18-4**
**Existing Views**

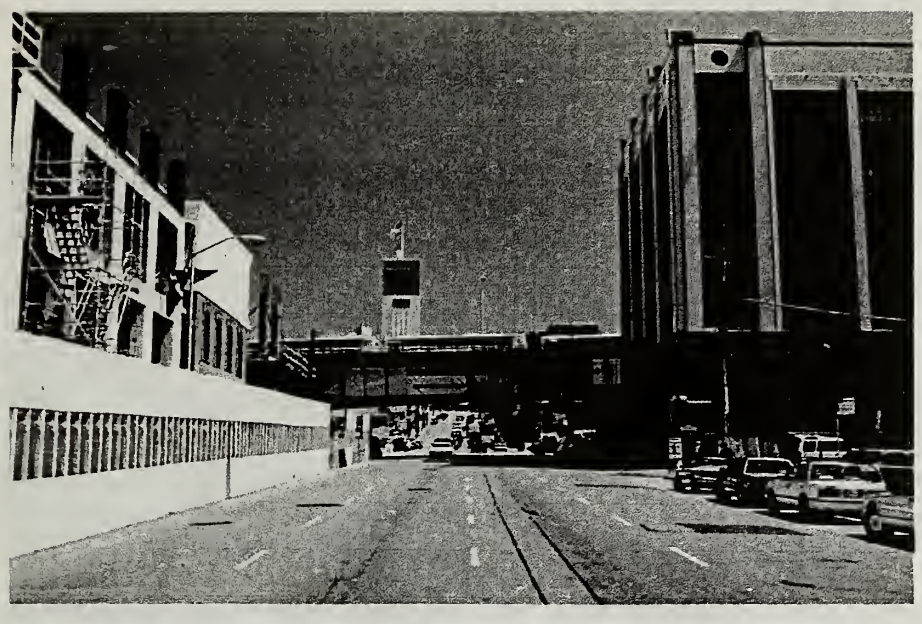


Fig 5A First Street, Near Howard Street, Looking South to Bank of America Clock Tower

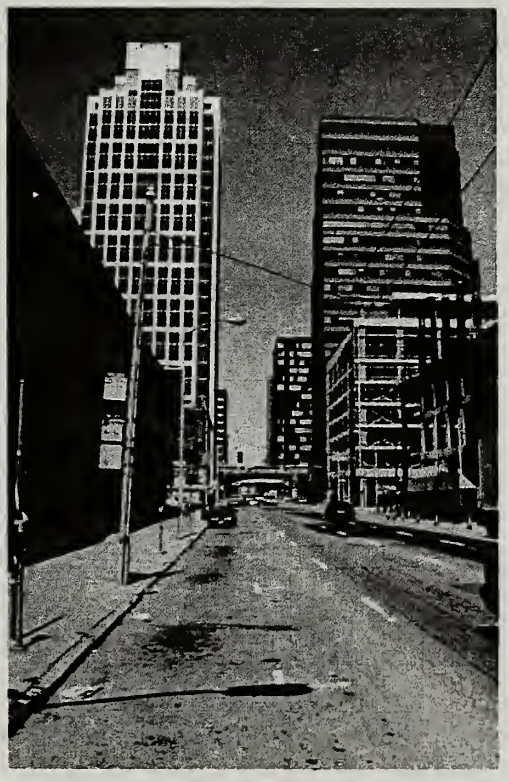


Fig 5B Howard Street, Near First Street, Looking East
to New Office Tower (199 Fremont Street)



SOURCE: Environmental Science Associates
Parsons Transportation Group

**Figure 4.18-5**
**Existing Views**

Large structures visually define the northern and southern edges of the study area. The Bay Bridge stands high over the southeastern corner of the study area and a wall of modern skyscrapers define the northern and northeastern edge of the project area, while the office towers at 199 Fremont Street and 301 Howard Street rise above the Transbay Terminal ramps (Figure 4.18-5B). Building heights range from 550 feet along Mission Street, among the highest in the City, to 40 feet along Second Street between Harrison and Bryant. Building heights decrease toward the southern side of Rincon Hill. Smaller scale development characterizes South Park, where building heights are roughly 40 feet. South of the Bay Bridge anchorage, buildings are a more moderate scale, ranging from 40 to 105 feet. Heights at the eastern edge facing the waterfront step down from the maximum at Mission and Fremont, to between 100 and 250 feet in the Rincon Center and Rincon Hill districts. Building heights at the western end of the study area approaching Yerba Buena Gardens range from 350 feet near Mission off New Montgomery to 40 feet at the southern edge of the area adjacent to the freeway.

Certain subareas are visually distinctive within the study area. The buildings within the Second Street-New Montgomery Corridor to the east convey their historic character in design and materials; their scale, and the visual importance given to architectural elements that face directly onto the streets (e.g., windows, doors), emphasize activity at street level. This historic corridor, between Market and Howard Streets, has a more traditionally "urban" character than most of the project area, emphasizing the activity of workers, shoppers and students moving within a built environment that retains a human scale.

In recent years, new office, hotel, and residential developments have been constructed along Second Street. The 143-foot tall office tower, clad in buff limestone with cool aqua windows, is one of the newer office buildings at 201 Second Street. The C-Net Building at 235 Second Street is 88 feet tall and is clad with a masonry façade joined to a contemporary glass curtain wall. The Marriott Courtyard Hotel with its slender and slightly arched massing reaches a height of 170 feet on the corner of Second and Folsom Streets. The new development on Second Street, contemporary in design, respects the street wall established by older structures, by setting towers back from the street.

Three subareas within the Transbay Terminal Area present relatively coherent overall images of place: the corridor of undeveloped land along Folsom Street; the area to the east of the existing Transbay Terminal that is a visual extension of the downtown office district; and the area within the Terminal loop, with its collection of small-scale commercial buildings.

As shown in Figure 4.18-6A, an expanse of pavement and parking exists along Folsom Street in the former location of the now-demolished Embarcadero Freeway. This visual setting is repeated on parts of the south side of the street, as well, where commercial and Postal Service parking lots and a Golden Gate Transit bus storage lot are interspersed among occasional buildings, including the landmark Klockars blacksmith shop beneath the massive PG&E substation at Folsom and Fremont. The recently restored loft building at Beale Street, the renovated Hills Plaza, and the Gap building just outside the Transbay Terminal Area at Spear Street are exceptions to the general visual character of this area.

Fig 6A Folsom Street at First Street, Looking East

Fig 6B Main Street at Howard Street, Looking North



SOURCE: Environmental Science Associates
Parsons Transportation Group

**Figure 4.18-6**
**Existing Views**

The downtown's large-scale buildings extend south of Mission Street, crossing at the Pacific Gateway Plaza at Beale and Mission Streets, reaching just south of Howard Street, east of Main Street (Figure 4.18-6B). In their relationship to the street, these newer buildings are in keeping with the post-1970 Market Street office towers, sometimes set back from the street and typically with plazas and other open spaces in front and behind. While differing from the uniform street wall typical of the early 20th century downtown, the spaces between and around newer towers set off these taller buildings and moderate the perceived scale of the South of Market blocks.

Within the Transbay Terminal ramp system, where development has been restricted by the presence of the ramp structures, is a relatively intact early 20th century commercial neighborhood. Looking out from within, the elevated ramps provide a sense of enclosure. This is particularly pronounced in the Tehama Street alleyway, where the scale of street and building combines to distance the larger city beyond.

The southern edge of the study area is visually defined by larger-scale industrial and warehouse structures, transportation infrastructure, residential buildings, and recreational facilities. Three to four-story brick structures with large floorplates front on wide (82.5 feet) streets in the vicinity of the existing Caltrain Station at Fourth and Townsend Streets. Many of these former manufacturing structures have been rehabilitated and adaptively reused. Transportation infrastructure visually dominates the area between Seventh to Fourth Streets along Townsend Street. Caltrain tracks traverse the rail yard, and parked trains, utility sheds, light stands, and power lines characterize the rail yard's visual attributes. Figure 4.18-7 shows the Caltrain storage yard in the foreground, the Sixth Street off-ramp from I-280 to the east, buildings fronting on Townsend Street to the north, and the distinctive downtown mound of high rises in the background to the northeast.

Residential development visually differs from the warehouse and light industrial structures in the area. Since the mid-1980s, mid- and large-scale residential buildings (generally four to 14 floors) have been constructed within the southern edge of the study area (predominately in the South Beach neighborhood along The Embarcadero). These taller structures stand out from the industrial buildings surrounding them due to their height and massing. Newer apartment buildings are taller and include landscaped open spaces. Mission Bay North, southeast of the existing Caltrain Terminus, is being developed with dense, large scale (80 to160 feet) residential structures on the blocks adjacent to Third, Fourth, Fifth, King, and Townsend Streets.

Recreational uses are concentrated in the southeastern section of the study area. These uses are characterized by larger-scale public facilities and smaller, more intimate spaces. Pacific Bell Park is located at Third and King Streets. The 45,000-seat baseball park recalls traditional architectural elements in its design, such as its location within the existing urban street grid, the use of building materials (brick and steel), public spaces with shops and restaurants, landscaping features and a unified signage program. The ballpark harmonizes with existing adjacent structures.

View of Caltrain Storage Yard and Downtown San Francisco Looking Northeast



SOURCE: Environmental Science Associates
Parsons Transportation Group

**Figure 4.18-7**
**Existing Views**

Just to the south of Pier 40, the South Beach Marina provides a visual break from the built environment along The Embarcadero. Watercraft can be seen docked in the marina. Strong and organized smaller-scale development adjacent to the grassy open space and play area in South Park creates an effective contrast and makes the street space between the two pleasing.

### 4.18.2 Visual Resources

Within the general area near the proposed project (see Figure 4.18-1), several buildings, generally in the New Montgomery-Second Street Conservation District and adjacent Rincon Hill area, exhibit architectural styles of historical interest. The area also has a limited number of structures that have been recognized as possessing exceptional value either by themselves or because they represent the work of major architects. A notable example is the existing Transbay Terminal, designed by Timothy Pfleuger in 1939 (Figure 4.18-8A). Others in the Rincon Hill District include: the PG&E and Matson Buildings on Market between Beale and Main Streets; the aforementioned Bank of America (former Union 76) clock tower by Louis Hobart; the Hearst Building at Third and Market Streets; and the Pacific Telephone Building, Rialto Building, Sharon Building, Call Building, Palace Hotel, and Palace Garage, among others, in the New Montgomery-Second Street Conservation District. Most of these buildings are north of Mission Street, and nearly all are north of Howard Street.

Aside from the more distinguished examples of the architectural works listed above, the area contains a diversity of building forms, masses, building styles and materials that provide visual interest. Massive buildings visually define the northern boundary of the study area. High-rises, varying in height and bulk, color and façade treatment, punctuate the northern edge of the area and provide a clearly delineated visual edge from the generally low-rise area to the south. Narrow streets such as Minna, Natoma, Tehama, and Clementina Streets provide a diversity of scale and views compared to the larger blocks generally found west of First Street. Narrow streets (typically about 35 feet wide) are generally developed with lower structures with larger footprints and minimal setbacks that create a sense of enclosure at the street level. In contrast, the area also contains larger streets (typically about 86 feet wide) such as Folsom, Harrison and Mission Streets, developed with larger structures, some with setbacks or open space that tend to accentuate the width of the street and the size of the buildings fronting them.

Natural features such as the San Francisco Bay complement the built environment within the proposed Redevelopment Area and provide an edge to the area to the east. The water's edge provides a visual resource and is revealed at the termini of Folsom, Howard, and Mission Streets at the eastern edge of the district. Other than the landform of Rincon Hill, natural features within the study area are generally limited to landscaping associated with residential and commercial developments. Specific landscape designs create small areas of visual interest, such as the grassy oval park in South Park, the open space along the Embarcadero Promenade on the eastern border of the study area, or the grass "benches" in front of the Marathon Plaza on Second Street.

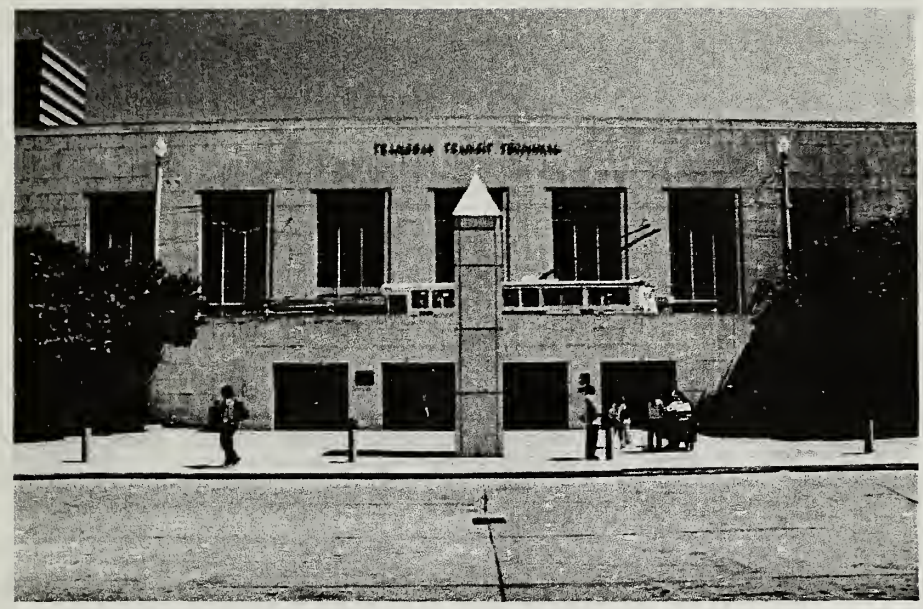


Fig 8A Transbay Terminal Building

Fig 8B Folsom Street, Near Fremont Street, Looking East to the Bay



SOURCE: Environmental Science Associates
Parsons Transportation Group

**Figure 4.18-8**
**Existing Views**

Transportation infrastructure provides other unique views within the Transbay Terminal Area. The network of ramps connected to the Terminal visually defines the area. These ramps cross over Howard, Beale, Fremont, First, Folsom, Essex, Clementina, Tehama, and Natoma Streets. Ramps interrupt views across the district and provide a sense of enclosure. From the Transbay Terminal, the ramps lead to the Bay Bridge. These ramps block views to the Bay and to Rincon Hill, create dark and cramped spaces underneath (generally attracting surface parking uses) and act as visual reference points within the Transbay Area. To the south, the proposed Transbay Redevelopment Area is visually subsumed and blocked by the greater mass of the Bay Bridge and its western approach.

### 4.18.3 Scenic Views and Vistas

Due to its location at the eastern edge of the City, its generally flat terrain, and the low-rise character of most of its developed uses, the proposed Transbay Redevelopment Area provides a rich variety of views. Unobstructed long-range views of major regional landmarks are available throughout the study area. These include the Bay, Treasure Island, Yerba Buena Island, the East Bay Hills, the Bay Bridge, Twin Peaks, and the downtown skyline. The study area also affords smaller-scale views, such as streetscapes in which visual interest is provided by architectural elements or vegetation in the foreground.

As a result of its generally level topography and the regular street grid, regional landmarks are framed in well-defined visual corridors established by such major streets as Market, Mission, Folsom, Harrison, and Howard Streets. In these axial views, Twin Peaks to the west and the Bay to the east provide the visual endpoints of the corridor and consequently a measure of orientation (Figure 4.18-8B). Where these endpoints are built elements, parallel horizontal lines defined by the roadway, sidewalks, and building elements appear to converge toward those buildings, further enhancing their visual importance (Figure 4.18-9A). Because the visual landmarks generally visible along the east-west corridors are natural features, they also provide strong and, under some lighting and water conditions, dramatic contrast with the built urban environment. In certain cases – for example, the easterly view down Market Street of the Ferry Building – the area's visual corridors may frame buildings with distinctive architecture and historic or civic meaning. Views toward the water are partially framed by buildings of varying height along Mission, Howard, Folsom and Harrison Streets. Views at some points are interrupted by overpasses, and dissipate and are distracted by the numerous surface lots (Figure 4.18-9B).

North-south axial views within the study area (e.g., First and Second Streets, Main, Beale, and New Montgomery Streets) typically focus on structures, although with expanses of sky behind. The structures, too, may be regional landmarks and include the Bay Bridge and downtown office towers. Under certain viewing conditions, the sky is an important component of the north-south axial views: in the evening, skyscrapers may be viewed against banks of fog blowing into the Bay, with the setting sun highlighting the edges of clouds and buildings.

Fig 9A Fremont Street at Harrison Street, Looking North to Downtown

Fig 9B Folsom Street at Second Street, Looking East



SOURCE: Environmental Science Associates
Parsons Transportation Group

**Figure 4.18-9**
**Existing Views**

The existing Transbay Terminal and its ramps obstruct important axial views including north-south views along First, Fremont, and Beale Streets that are walled off by the structure of the Terminal that bridges the street. In addition, views southward through the proposed Redevelopment Area are partially obscured by the Terminal ramps and the rising topography of Rincon Hill. Views in the southern section of the study area are of I-280, China Basin Channel, the Bay, Potrero Hill, the downtown high-rises, and intervening development in South of Market neighborhoods.

### 4.18.4 Element in the Cityscape

The proposed Transbay Redevelopment Area is a component of panoramic views of the City and it is part of the dynamic view sequences experienced while entering the City on I-280 from the south and the Bay Bridge from the east. From northbound I-280, views of downtown are readily available to the north. From this vantage, the dense cluster of high-rises gradually rising in height from SOMA produces a total effect that characterizes San Francisco's dense downtown core. To the west, Sutro Tower is visible atop Twin Peaks and fragments of the Bay Bridge can be seen to the east.

In views from westbound lanes of the Bay Bridge, the Transbay Redevelopment Area occupies the near land edge; in northerly views from the approaches to the Bay Bridge, it establishes an open foreground for panoramic views of the downtown area beyond. In these views, the area's generally level terrain and lack of prominent large-scale structures reduce its visual importance, especially in relation to the distinctive features beyond (e.g., downtown high-rise structures, Twin Peaks). The proposed redevelopment area thus serves now as a generally neutral part of the visual context for major view elements.

Due to variations in San Francisco's topography, the proposed Transbay Redevelopment Area is visible from many locations from within the City. Views of the proposed project area are available from Dolores Park in the Dolores Heights neighborhood. The general flatness of the proposed redevelopment area contrasts with the high-rises located north of Market Street. This view is framed by the Bay and East Bay hills in the background. Similar views are available from Twin Peaks; the proposed project area is a part of a sweeping vista that stretches as far as Russian Hill to the north and Portrero Hill to the south. Views of the proposed Transbay Redevelopment Area are also available from the upper stories of downtown high-rises, specifically from windows with a southern orientation.

# CHAPTER 5: ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

This chapter analyzes the potential impacts of the proposed project and suggests mitigation measures for the impacts identified. Long-term effects -- those associated with operation of the project or that result from project right-of-way requirements -- short-term, construction phase impacts, and cumulative impacts are addressed. Discussions are organized by environmental topic area, except that construction phase impacts are discussed together, following the presentation of longer-term effects. In order to avoid repetition, a few environmental issues are addressed primarily in the construction phase impacts section, because their associated effects would derive primarily from construction activities.

NEPA and CEQA incorporate differing provisions affecting identification and mitigation of impacts. CEQA requires identification of impact level of significance in an EIR, whereas NEPA considers level of significance in determining whether or not to prepare an EIS and, once the decision to prepare an EIS is made, reports project impacts without defining level of significance. Similarly, CEQA requires mitigation only for significant adverse impacts, while NEPA allows for mitigation of all of the impacts of a project. This combined NEPA/CEQA document reports all of the impacts of the proposed project, and proposes mitigation wherever practicable to reduce the impacts identified. Chapter 7 provides specific discussion of impact significance and mitigation in accordance with CEQA.

## 5.1 LAND-USE, WIND, AND SHADOW

This section evaluates long-term land-use, wind and shadowing impacts of the proposed project. Construction-phase impacts are addressed in Section 5.21.

### 5.1.1 Land Use Impacts

The land use impacts resulting from each of the three project components are considered and compared to the No-Project Alternative. A discussion is also included of the overall effects of the project on neighborhood character and its consistency with existing plans and policies.

#### 5.1.1.1 Transbay Terminal Land Use Impacts

The proposed Transbay Terminal would be located at the site of the existing terminal structure on Mission Street at First, Fremont and Beale Streets, *approximately 150 feet to the west of the present terminal footprint.* The existing Terminal would be demolished and a new multi-modal transit facility would be constructed in its place. There are two alternatives being considered for the new Transbay Terminal: the West Ramp and Loop Ramp Alternative. The main differences between the West Ramp Alternative and the Loop Ramp Alternative are the size of the terminal,

amount of ramp area, and the potential availability of land opened up for new development by removing sections of the existing ramp network.

**West Ramp Alternative.** Under the West Ramp Alternative, the Transbay Terminal would be one story taller than under the Loop Ramp Alternative, but would be constructed *approximately* on the footprint of the existing terminal, *but about 150 feet to the west. This would result in the terminal structure no longer spanning Beale Street.* The existing ramp segments on the east side of the Transbay Terminal (north of Howard Street, just east of Beale Street, then looping south and west to Essex Street) would be removed. However, the I-80 Fremont Street off-ramp would remain in place west of Fremont Street. Circulation between the Terminal and the Bay Bridge would occur on a ramp segment oriented on a north-south axis. In terms of land use, the West Ramp Alternative would open up new developable area on the blocks south and east of the Terminal at Beale and Howard Streets and Folsom at Beale and Main Streets, and would create opportunities for mid-block pedestrian throughways between towers fronting on Folsom Street or increase the amount of mid-block open space.

**Loop Ramp Alternative.** Under the Loop Ramp Alternative, the existing ramp segments on the east side of the terminal would be rebuilt in generally the same location and would continue to provide circulation between the Terminal and the Bay Bridge. Thus, in terms of land use, the Loop Ramp Alternative would provide less land area for future new transit-oriented development. When compared with the West Ramp Alternative, the Loop Ramp Alternative would lessen the amount of developable area on the blocks south and east of the Terminal at Beale and Howard Streets and Folsom at Beale and Main Streets, and would possibly limit planned mid-block pedestrian throughways between towers fronting on Folsom Street or decrease the amount of mid-block open spaces. In addition, the ramps would continue to be seen by some as a barrier in the district, walling off uses inside of the loops from uses located outside. Under any Terminal Alternative, however, the I-80 Fremont Street off-ramp will continue to impinge on the development along Fremont Street north of Folsom Street.

**Impacts Common to Both Transbay Terminal Alternatives.** Land use impacts would result under either Transbay Terminal Alternative. Development of the Terminal and the temporary terminal would require the acquisition of *11* parcels and demolition of five buildings (see Section 5.2, Displacements and Relocation).

Additional impacts would occur due to off-site staging and parking requirements for both AC Transit and Golden Gate Transit. Buses would be stored *under the West Approach to the Bay Bridge between Stillman, Perry,* Second and Fourth Streets, a site currently used for automobile parking. The project would include the construction of a parking deck *immediately west of Fourth Street between Perry* Street to the north and *Stillman* Street to the south, to make up for the loss of surface parking being used as a transit storage area.

The new terminal, regardless of the design alternative selected, would cause an increase in pedestrian traffic in the vicinity of the transit facility, creating a possible heightened demand for ground-floor retail uses, including, but not limited to restaurants, cafes and convenience retail, to

serve the increased numbers of transit patrons. The new Transbay Terminal could intensify land uses in its vicinity. Other land use effects resulting from the proposed Terminal would mainly be associated with the construction and operation of its ramps and the temporary bus storage facilities required during the construction of the terminal structure.

**No-Project Alternative.** Under the No-Project Alternative, a new Transbay Terminal would not be constructed. The existing terminal would be retrofitted and low-capital-cost transportation improvements would be implemented. Opportunities for revitalization in the Transbay area, such as establishing new open spaces, would be substantially less for the No-Project Alternative compared to *the* West Ramp Transbay Terminal Alternative, for example. Under the No-Project Alternative, the existing ramp network would continue to act as a barrier by dividing proposed new development and existing land uses in the area. Additionally, the ramps occupy considerable ground area that would not be available for future development and also may limit future development of adjacent lots.

### 5.1.1.2 Caltrain Downtown Extension Land Use Impacts

Two alignment alternatives are considered for the Caltrain Downtown Extension: the Second-to-Main Alternative and the Second-to-Mission Alternative. Both a cut-and-cover and tunneling option have been defined for each Caltrain Extension Alternative. The alternatives and options present distinct engineering opportunities and constraints. The cut-and-cover construction method for either alternative would involve the acquisition and demolition of up to 23 existing buildings. Land use impacts associated with the loss of these buildings are described in this section, while more detail regarding the parcels and buildings that would be acquired is provided in Section 5.2. Interim disruptions to land uses that remain in the project area could be anticipated for either alternative, as described in Section 5.21.

The affected properties for both Caltrain Alternatives are located in the vicinity of Second and Howard Streets, with additional properties on Mission Street affected under the Second-to-Mission Street Alternative. Eleven additional parcels with 10 building in the Second and Townsend Streets area would be acquired and demolished under the Cut-and-Cover Option but would remain under the Tunneling Option. See also Figure 4.1-1, in Chapter 4, which shows the land use context for these affected properties.

Affected properties would be purchased according to the procedures set forth in the Real Properties Acquisition Act. Structures would then be demolished to facilitate cut-and-cover construction of the tunnel.

At the Townsend and Second Streets intersection, cut-and-cover construction would require demolition of structures located mainly along the north side of Townsend Street (west of Second Street) and the west side of Second Street (north of Townsend). Land uses at this location consist mainly of industrial uses, with some office uses and two residential buildings. The

affected structures were constructed between 1906 and 1927 (although some have been dated earlier), and one contemporary residential building was constructed in 1996.

At the Second/Howard Street intersection, the project would require demolition of structures generally located on the east side of Second Street (between Minna and Howard Streets) and on the north side of Howard Street (east of Second Street). These structures contain industrial, office, residential and restaurant uses. The affected structures were constructed between 1906 and 1921, and one contemporary residential building was constructed in 1980. Three structures slated for demolition as part of the project (Class B and C office buildings) are located within the New Montgomery-Second Street Conservation District, *which overlaps the Second and Howard Streets Historic District.* Two structures south of the Second/Howard Street intersection would also require demolition to permit cut-and-cover construction. These structures are located along Second Street and include Class C office uses (built between 1906 and 1912). There is also a vacant lot used for surface parking.

The existing land uses described above would be displaced by project construction. Once project construction is completed, the cleared properties would be made available for development. Future land uses on these sites would be required to conform to the area's zoning, General/Area Plan requirements, and Redevelopment Agency's Guidelines (for properties located within the Redevelopment Area).

In addition, there is at least one major development proposal that has the potential to conflict with the Second-to-Mission Caltrain Extension Alternative – a 605-foot tall, 1,068,400 gross square foot mixed use development proposed at 301 Mission Street (Assessors Block 3719, lots 1 and 17). This proposal *has completed its* environmental review *and has received* various approvals from *City decision-makers.* The *current* proposed configuration of the foundation piling and underground parking for 301 Mission *takes into account the need for a small amount of property on the southern-most part of the parcel by the Transbay Terminal/Caltrain Downtown Extension Project for the Second-to-Main Caltrain Extension Alternative, the adopted LPA.*

In the long-term, however, the Transbay Terminal*/Caltrain Downtown Extension* project would not disrupt or divide the physical arrangement of the established community. Because many of the buildings that would be removed are older buildings, some of which are listed or eligible for listing in the National Register of Historic Places (as described in Section 5.14), there would be a change in the character of the area. This change would be lessened by the fact that there are already many new buildings in the general vicinity. The majority of the square footage that would be demolished is in office use, representing only a small portion of the office space throughout the City. Loss of this office space would not adversely affect the City's supply, particularly given that many of the recently constructed buildings in the area provide additional office space.

### 5.1.1.3 Redevelopment Land Use Impacts

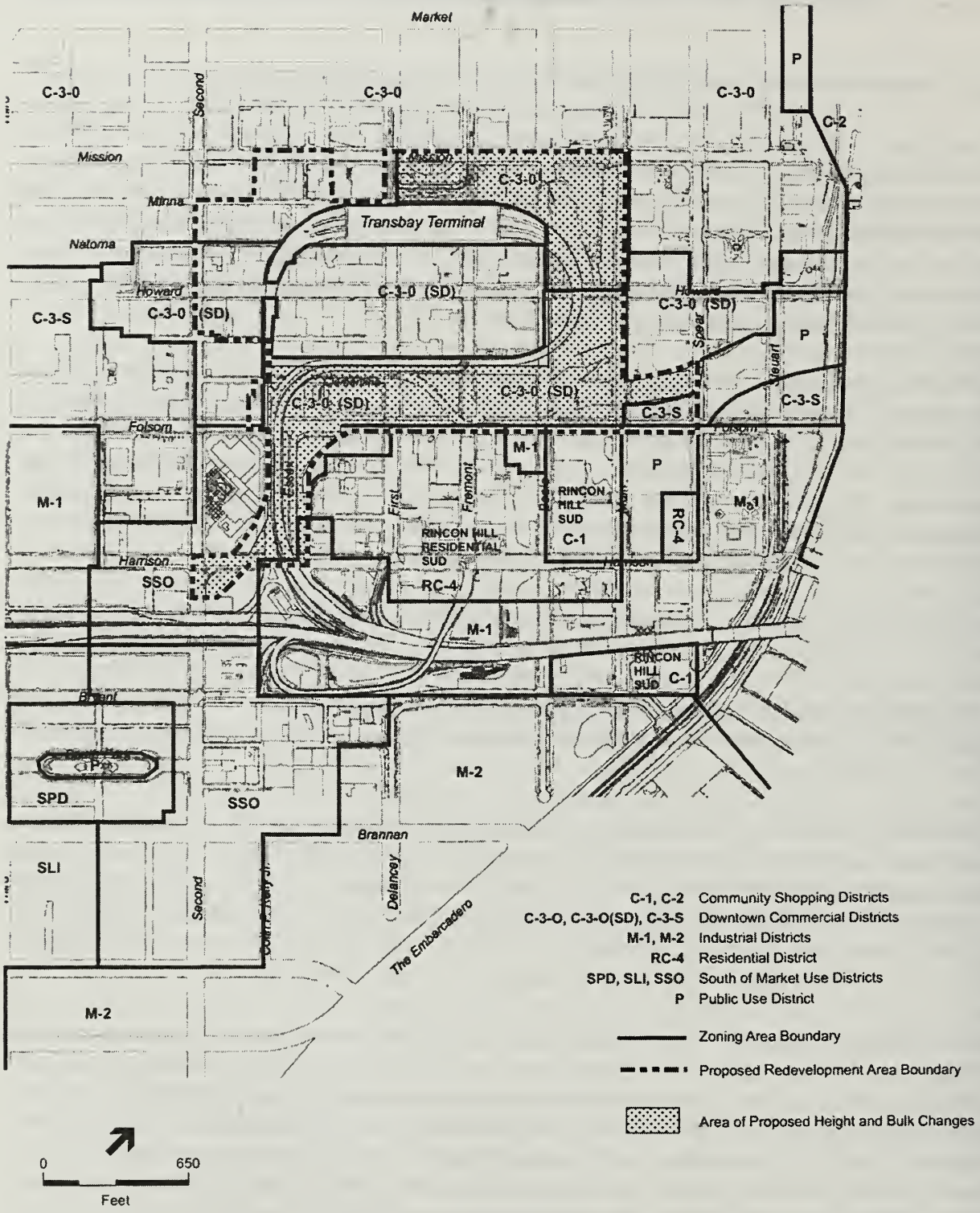
As described in Chapter 2, two redevelopment alternatives are proposed: the Full-Build Alternative and the Reduced Scope Alternative. Each alternative would include zoning changes and the establishment of a redevelopment area that generally would allow land uses that are currently allowed in the Transbay Study Area, with the exception of the P-zoned properties where the former freeway and ramps were located. Because the project would provide for new development, notable changes would be expected in the Transbay Redevelopment Area, especially with respect to urban form and the intensity of land use.

**Full-Build Alternative.** The Full Build Alternative would result in a mix of residential, office, hotel, and retail uses. This alternative would consist of land uses that are already permitted within the vicinity of the Transbay Study Area. As described in Chapter 2 and shown on Figure 2.2-22, the Full Build Alternative would result in development of 5.6 million square feet of residential uses (4,667 residential units, including affordable housing), close to 1.2 million square feet of office uses, 475,600 square feet of hotel uses, and more than 355,400-square feet of retail uses, or about 7.6 million square feet of development, overall.

Proposed changes to existing zoning would occur predominately along the blocks on Folsom Street, as well as those at the site occupied by the Transbay Terminal and along its ramps to the west of Essex Street to First Street. Existing parcels zoned P would be rezoned to either C-3-O or C-3-O (SD) to facilitate and further the goals of the redevelopment plan. Proposed changes to the height and bulk regulation would occur on the same blocks. These changes are identified in Table 5.1-1 and on Figures 5.1-1, 5.1-2, and 5.1-3.

As indicated in Table 5.1-1, existing height and bulk limits range from 30-X at the site of the current Transbay Terminal to 400-S at Mission and Beale Streets. Existing height limits are, on average, approximately 80 feet. Under the Full Build Alternative, height limits would range from 150 feet around Essex Street to 400 feet along Folsom Street. The maximum height limit established under the Full Build Alternative would be 550 feet, at a proposed hotel site at Mission and Fremont Streets, adjacent to the proposed Transbay Terminal.

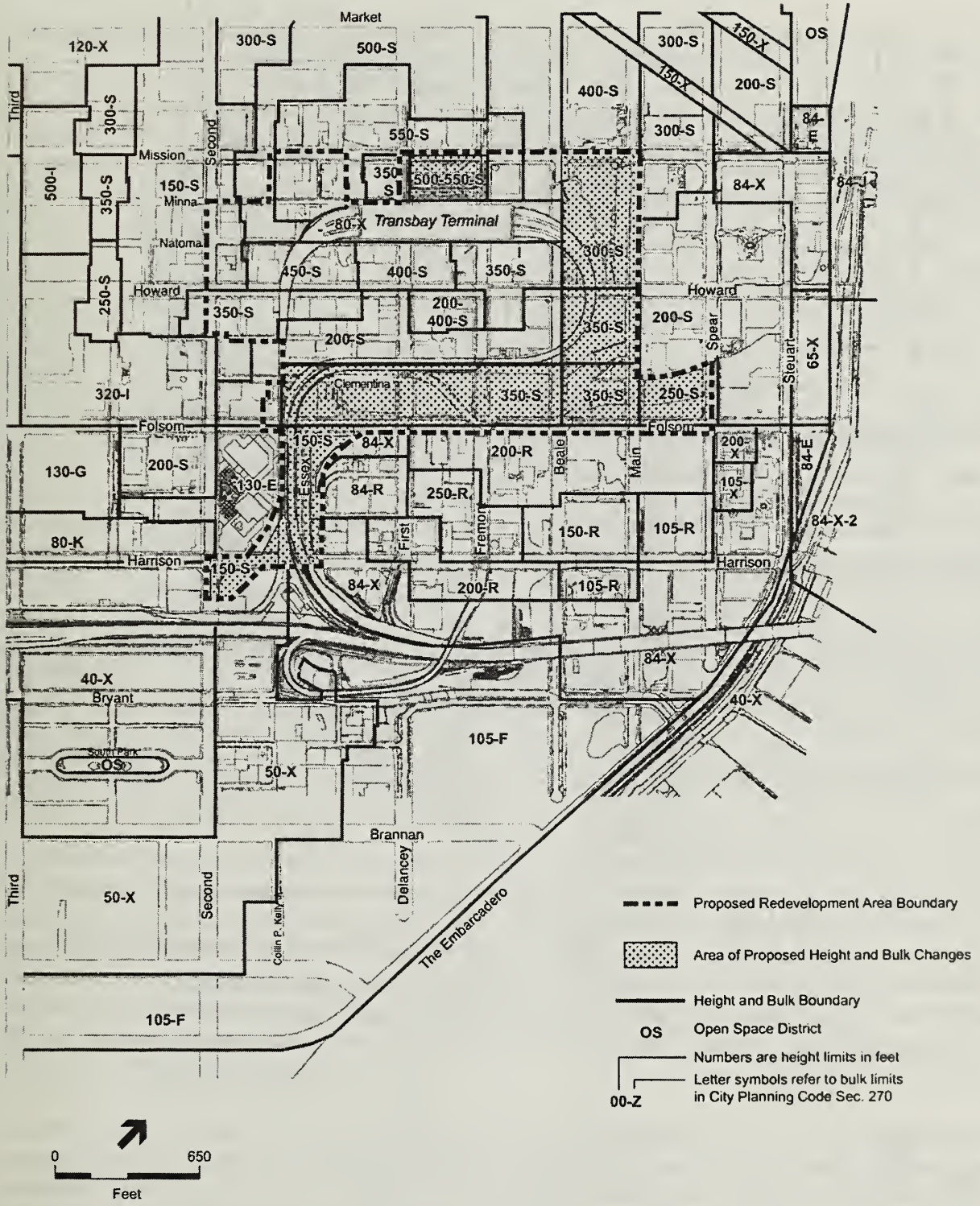
**Reduced Scope Alternative**. The Reduced Scope Alternative would result in less commercial and retail development and is weighted more toward housing. This alternative assumes approximately four million square feet of residential development (approximately 3,430 dwelling units), 350,000 square feet of hotel uses, and approximately 260,000 square feet of retail development, or 4.7 million square feet overall. The *base* zoning changes proposed under the Reduced Scope would be identical to those proposed under the Full Build, *although the height and bulk designations are different.* Existing parcels zoned P (Public) would be zoned to C-3-O or C-3-O (SD) to accommodate housing or retail uses.




SOURCE: Parson's Transportation Group, Inc., Environmental Science Associates

*Transbay Terminal/Caltrain Downtown Extension / 201050* ■

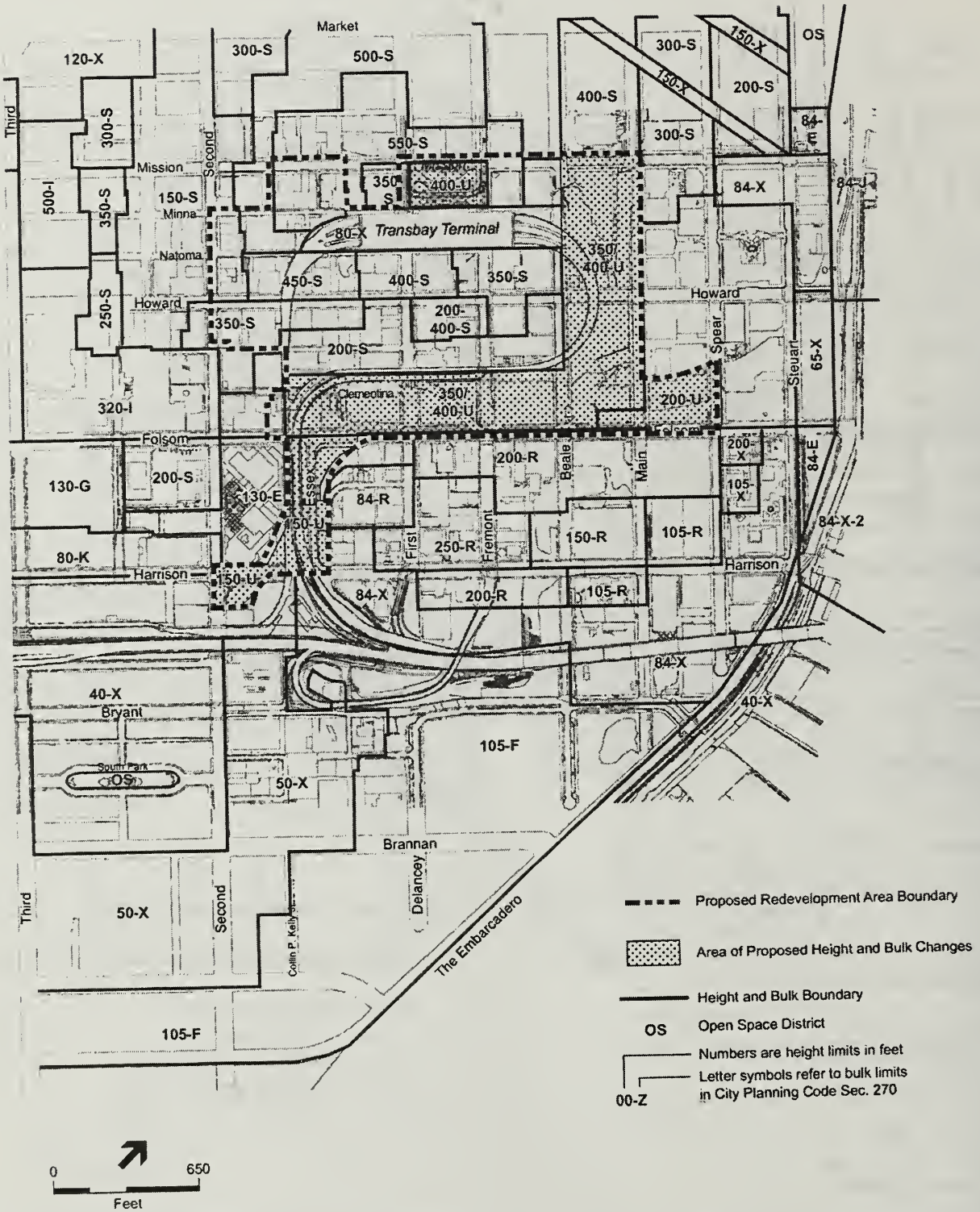
**Figure 5.1-1**
Proposed Zoning,
Full Build and Reduced Scope Alternatives




SOURCE: Parson's Transportation Group, Inc., Environmental Science Associates

*Transbay Terminal/Caltrain Downtown Extension / 201050* ■

**Figure 5.1-2**
Proposed Height and Bulk Districts
Full Build Alternative




SOURCE: Parson's Transportation Group, Inc., Environmental Science Associates

*Transbay Terminal/Caltrain Downtown Extension / 201050* ■

**Figure 5.1-3**

Proposed Height and Bulk Districts
Reduced Scope Alternative

**Table 5.1-1: Existing and Proposed Zoning in the Proposed Transbay Terminal Redevelopment Area**

| Assessor's Block | Block Bounded by: | Zoning Districts | | Height/Bulk Districts | | |
|---|---|---|---|---|---|---|
| | | Existing | Proposed* | Existing | Full Build | Reduced Scope |
| 3718 | Mission, Main, Howard, and Beale Streets | P, C-3-0, C-3-0 (SD) | C-3-0 | 80-X, 80X \ 400S | 300-S | 350-*U* |
| 3720 | Mission, Fremont, Howard, and First Streets | P | C-3-0 | 30-X / 80-X | 550-S | 400-*U* |
| 3736 | Howard, First, Folsom, and Second Streets | P | C-3-0 (SD) | 80-X \ 200-S | 350-S | 400-*U* |
| 3737 | Howard, Fremont, Folsom, and First Streets | P, C-3-0 (SD) | C-3-0 (SD) | 80-X | 350-S | 400-*U* |
| 3738 | Howard, Beale, Folsom, and Fremont Streets | P | C-3-0 (SD) | 80-X | 350-S | 350-*U* |
| 3739 | Howard, Main, Folsom, and Beale Streets | P, C-3-0, C-3-0 (SD), C-3-S | C-3-0 (SD) | 80-X, 90-X, 200-S | 350-S | 350-*U* |
| 3740 | Howard, Spear, Folsom, and Main Streets | P, C-3-S | C-3-0 (SD) | 40-X, 200-S | 250-S | 200-*U* |
| 3749 | Folsom, First, Harrison, and Second Streets | M-1 | C-3-0 (SD) | 84-X | 150-S | 150-U |
| 3764 | Harrison, Rincon, Bryant, and Second Streets | P | C-3-0 (SD) | 50-X | 150-S | 150-U |

Zoning Districts: C-3-0: Downtown commercial office; C-3-0 (SD): Downtown commercial office (special development); C-3-S: Downtown support; M-1: Light industrial; P: Public use; S: See Planning Code Section 270(d) or refer to Height and Bulk maps 1H, 2H and 7H of the Zoning Map; U: Maximum plan dimensions for buildings over 80 feet but less than 300 feet in height: 100 feet (length), 125 feet (diagonal dimension); buildings greater than 300 feet: 115 feet (length). 145 feet (diagonal dimension). Building setbacks would be required pursuant to Planning Code Section 253.2.

* proposed *zoning district designation* for both the Full Build and Reduced Scope/Variant Alternatives are identical

**Source:** The San Francisco Planning Department, June 2001

The Reduced Scope Alternative differs from the Full Build scenario in the proposed the heights and bulks of the proposed new structures on certain blocks. Under the Reduced Scope Alternative, Assessor Block 3720 would accommodate a hotel at a height of approximately 400 feet, which would be up to 150 feet shorter than allowed under the Full Build Alternative. The Reduced Scope Alternative would permit building heights of up to 50 feet higher than under the Full Build Alternative on the blocks between Beale and Main and Mission and Folsom Streets, and on Folsom Street, along the southern boundary of the Transbay Redevelopment Area boundary.

As indicated in Table 5.1-1, existing height and bulk limits range from 30-X at the site of the current Transbay Terminal to 400-S at Mission and Beale Streets. Existing height limits are, on average, approximately 80 feet. Under the Full Build Alternative, height limits would range from 150 feet around Essex Street to 400 feet along Folsom Street. The maximum height limit established under the Full Build Alternative would be 550 feet, at a proposed hotel site at Mission and Fremont Streets, adjacent to the proposed Transbay Terminal.

**Reduced Scope Alternative**. The Reduced Scope Alternative would result in less commercial and retail development and is weighted more toward housing. This alternative assumes approximately four million square feet of residential development (approximately 3,430 dwelling units), 350,000 square feet of hotel uses, and approximately 260,000 square feet of retail development, or 4.7 million square feet overall. The zoning changes proposed under the Reduced Scope would be identical to those proposed under the Full Build. Existing parcels zoned P (Public) would be zoned to C-3-O or C-3-O (SD) to accommodate housing or retail uses.

The Reduced Scope Alternative differs from the Full Build scenario in the proposed the heights and bulks of the proposed new structures on certain blocks. Under the Reduced Scope Alternative, Assessor Block 3720 would accommodate a hotel at a height of approximately 400 feet, which would be up to 150 feet shorter than allowed under the Full Build Alternative. The Reduced Scope Alternative would permit building heights of up to 50 feet higher than under the Full Build Alternative on the blocks between Beale and Main and Mission and Folsom Streets, and on Folsom Street, along the southern boundary of the Transbay Redevelopment Area boundary. The main difference between the Reduced Scope and Full Build Alternative would be in building mass. Under the Reduced Scope, new towers would have, on average, smaller floor plates and would be more slender than those under the Full Build, due to the maximum diagonals of the building towers in the proposed U bulk district (see Table 5.1.3). The smaller, more slender floor plates also would result in increased spacing between towers, compared to bulkier building towers in the Full Build Alternative.

North of Folsom Street, there would be an expansion of office development, including high-rises, particularly near the site of the existing Transbay Terminal. As under the Full Build Alternative, the existing terminal at First and Mission Streets is proposed to be demolished, and a new terminal would be constructed at this site. Both alternatives would result in an expansion of educational and institutional uses, with open space surrounded by mid-rise structures. Farther west, existing historic buildings in the New Montgomery-Second Street Conservation District would remain, except for those buildings that would be demolished as part of the right-of-way acquisition for the Caltrain Downtown Extension alignment, providing a moderating buffer in building scale between Yerba Buena Gardens and the northwest corner of the Transbay Redevelopment Area. The Second Street corridor could become an increasingly attractive destination for street-level retail and restaurants and a pedestrian link between downtown and Pacific Bell Park at China Basin.

*The* main difference between the Reduced Scope and Full Build Alternatives would be in building mass. Under the Reduced Scope, new towers would have, on average, smaller floor plates and would be more slender than those under the Full Build, due to the maximum diagonals of the building towers in the proposed U bulk district (see Table 5.1.3). The smaller, more slender floor plates also would result in increased spacing between towers, compared to bulkier building towers in the Full Build Alternative.

North of Folsom Street, there would be an expansion of *residential* development, including high-rises, particularly near the site of the existing Transbay Terminal. As under the Full Build Alternative, the existing terminal at First and Mission Streets is proposed to be demolished, and a new terminal would be constructed at this site. Both alternatives would result in an expansion of educational and institutional uses, with open space surrounded by mid-rise structures. Farther west, existing historic buildings in the New Montgomery-Second Street Conservation District would remain, except for those buildings that would be demolished as part of the right-of-way acquisition for the Caltrain Downtown Extension alignment, providing a moderating buffer in building scale between Yerba Buena Gardens and the northwest corner of the Transbay Redevelopment Area. The Second Street corridor could become an increasingly attractive destination for street-level retail and restaurants and a pedestrian link between downtown and Pacific Bell Park at China Basin.

***Draft Transbay Redevelopment Area Design for Development Vision (August 2003).*** *Implementation of the current Design for Development Vision would result in a mix of residential, retail, office and hotel uses that would be similar to those uses under both the Full Build and Reduced Scope Alternatives. The Design for Development Vision would consist of land uses already permitted within the vicinity of the Transbay Area, and would result in development of roughly 4.14 million square feet of residential uses (3,378 residential units, including affordable housing), approximately 965,000 square feet of office uses, 475,000 square feet of hotel uses, and approximately 30,670 square feet of retail commercial use, with a total of about 5.6 million square feet of development.*

*This Design for Development Vision proposes land uses that would be consistent with the General Plan and the Planning Code, as they now exist and may be amended from time to time in the future. The Transbay Redevelopment Area Design for Development Vision would consist of three main land use zones: the Transbay Residential Zone (Zone 1), the Transbay C-3 Zone (Zone 2), and the Transbay Terminal and Ramp Environs (Zone 3). Because the Design for Development Vision would be consistent with the Full Build and Reduced Scope Alternatives, the changes to land uses in the Transbay Redevelopment area would be essentially the same as those illustrated on Figure 5.1-1.*

*The Redevelopment Area Design for Development Vision would result in land use effects identified for both the Full Build and Reduced Scope Alternatives. The Design for Development Vision would generally construct shorter buildings and fewer towers (specifically along Folsom Street) and fewer dwelling units than proposed under the Full Build Alternative. The Redevelopment Area Design for Development Vision would also include mid-block pedestrian passages, public open space in the form of parks, and private open spaces in the interiors of private residential developments.*

*Because the Redevelopment Area Design for Development Vision would be consistent with land uses analyzed for the Full Build and Reduced Scope Alternatives and because its proposed development program would be less dense (e.g., fewer dwelling units, less office and retail square footage) than the Full Build Alternative, the land use effects of the Design for*

*Development Vision would also not be adverse. As with both the Full Build and Reduced Scope Alternatives, rather than disrupting or dividing the community or adversely affecting its character, implementation of the Design for Development Vision could do the opposite by lending a positive neighborhood identity to an area that would provide a cohesive mix of jobs, housing and support services.*

**Impacts Common to Both Redevelopment Alternatives.** Both alternatives are expected to result in substantial open space areas in several portions of the Transbay Redevelopment Area, to complement the more intensive development. Folsom Street itself could be transformed from a relatively quiet (except at rush hour) street bordered by numerous undeveloped parcels to a built-out boulevard with residential and commercial uses side-by-side and a large amount of pedestrian traffic. This street would play an important role in defining the identity of the Transbay Redevelopment Area as a cohesive neighborhood, providing a mix of jobs, housing and support services.

**No-Project Alternative.** Under the No-Project Alternative new development, driven by market forces, is anticipated in the Transbay area. Existing programmed land uses would continue to the year 2020. Growth of office and residential uses would continue, but more slowly than under the above-described alternatives, and perhaps with less design guidance. Without any coordinated planning effort in the Transbay area, development in the district would occur on a per-parcel basis depending on the demands placed on the market. Development would occur under existing zoning and height and bulk regulations. Any proposed development would also be subject to Proposition M requirements concerning the amount of office space to be built, the timing of such development, and the impacts of the office square foot limitations (Planning Code Sections 320 and 321) on development. Sponsors seeking to develop the parcels zoned P (Public) would be required to seek a rezoning as part of their projects.

Because the area is designated as part of the Downtown Plan's Financial District north of Folsom Street, it could be assumed that office uses would locate in the area. There is a considerable amount of under-used land in the Transbay area and, depending on market forces, the area would act as an expansion area for high-density office uses that would otherwise occur north of Market Street. Most of the increase in residential development likely would occur on or near Rincon Hill. Because development would continue to occur in a less directed manner, the area could continue to lack definition or strong neighborhood identification, particularly compared to the Full Build or Reduced Scope Alternatives.

### 5.1.1.4 Neighborhood Character and Compatibility

An important goal of the Transbay redevelopment planning effort is to promote the development of a new mixed-use neighborhood. Both alternatives of the project's redevelopment component anticipate the development of residential, office, retail, service, and entertainment uses in a neighborhood in which these uses co-exist side-by-side or even within the same building. The potential incompatibility among uses is minimized by the exclusion of heavy industrial uses.

While the project could indirectly result in notable changes in land uses in the Transbay area, future development would be expected to intensify the urban character of the area and, particularly if planning efforts are successful, to result in a more cohesive neighborhood with a true mixture of residential and commercial activities. Rather than disrupting or dividing the community or adversely affecting its character, realization of the project's goals could do the opposite.

#### 5.1.1.5 Consistency with Existing Plans and Policies

A review was conducted to assess the project's conformity with the plans and policies that guide land use development in the study area. These plans include the San Francisco General Plan (with subsequent elements including: the Urban Design Element, the Commerce and Industry Element, the Transportation Element, the Residence Element, and the Recreation and Open Space Element); and local area plans contained within the General Plan, such as the Downtown Plan, the South of Market Plan, the Rincon Hill Plan, the Northeastern Waterfront Plan. Project compliance with San Francisco Redevelopment Agency Area Plans was also evaluated. These plans include the Rincon Point-South Beach Redevelopment Plan, the Yerba Buena Center Redevelopment Plan, and the Mission Bay North Redevelopment Plan. The proposed project would not conflict with any of the policies contained in the documents stated above.

The City's General Plan, which provides general policies and objectives to guide land use decisions, contains some policies that relate to physical environmental issues. The current project would not obviously or substantially conflict with any such policy that would apply to the project.

In general, any potential conflicts with the General Plan are considered by decision makers independently of the environmental review process, as a part of the decision whether to approve or disapprove a proposed project. Any potential conflict not identified here could be considered in that context, and would not alter the physical environmental effects of the proposed.

No mitigation measures are indicated. Relocation impacts and mitigation are addressed in Section 5.2.

### 5.1.2 Wind Impacts

A wind tunnel test was performed for two massing scenarios, as documented in the Wind Test Technical Memorandum and summarized in this section. The first massing scenario represents the Full Build Alternative and consists of generic building masses constructed to the height and bulk limits for each parcel or block. The second massing scenario represents the Reduced Scope Alternative. It contains nearly 35 percent less floor area but has towers that are taller and more slender than those of the Full Build Alternative.

The new Transbay Terminal design was used in both tests. For the wind tunnel testing, adverse impact was defined as wind conditions that exceed the City of San Francisco Planning Code Section 148 wind hazard criterion of 26 miles per hour for more than one full hour per year.

### 5.1.2.1 Wind Test Point Locations

Wind test locations are shown in Figure 5.1-4. The study evaluated conditions under the four prevailing wind directions (northwest, west-northwest, west and southwest) that are the most common in San Francisco.

In general, the testing focused on public streets and sidewalks located (generally near high-rise building sites) throughout the Transbay Terminal Redevelopment Area.[1] For purposes of this analysis, test locations were grouped into four subareas, as follows:[2]

- Adjacent to or near the Transbay Terminal building (15 test points).
- Within the redevelopment area bounded by Mission, Main, Folsom, and Beale Streets (17 test points).
- Within the redevelopment area adjacent to Folsom Street (31 test points).
- Within the redevelopment area adjacent to or near Essex Street (6 test points).

### 5.1.2.2 Full-Build Alternative, Wind Impacts

Development proposed as part of the Full-Build Redevelopment Plan would introduce new buildings at heights and massing greater than under current conditions. Wind conditions would be considered moderate to windy; the average for all 61 test points would be about seven mph, about 1.5 mph higher than the average for the existing conditions. Wind speeds in the pedestrian areas would range from one mph (No. 10) to 18 mph (No. 57). Wind speeds of 14 mph or higher would occur at three locations (Nos. 52, 57, 59). Fifty-two of the 61 locations would meet the Planning Code's pedestrian-comfort criterion value of 11 mph, while nine locations (Nos. 42, 48, 49, 52, 53, 56-59) would not. Under this Alternative, the Planning Code's wind hazard criterion would be exceeded at one of the 61 test locations: test site number 57 in the Essex Street wind study subarea.

**Transbay Terminal Wind Study Subarea.** Winds in this area would be moderate to windy, with speeds ranging from one mph (No. 10) to 10 mph (No. 2). Of the 15 points in this subarea, all would continue to meet the Planning Code's pedestrian-comfort criterion value of 11 mph.

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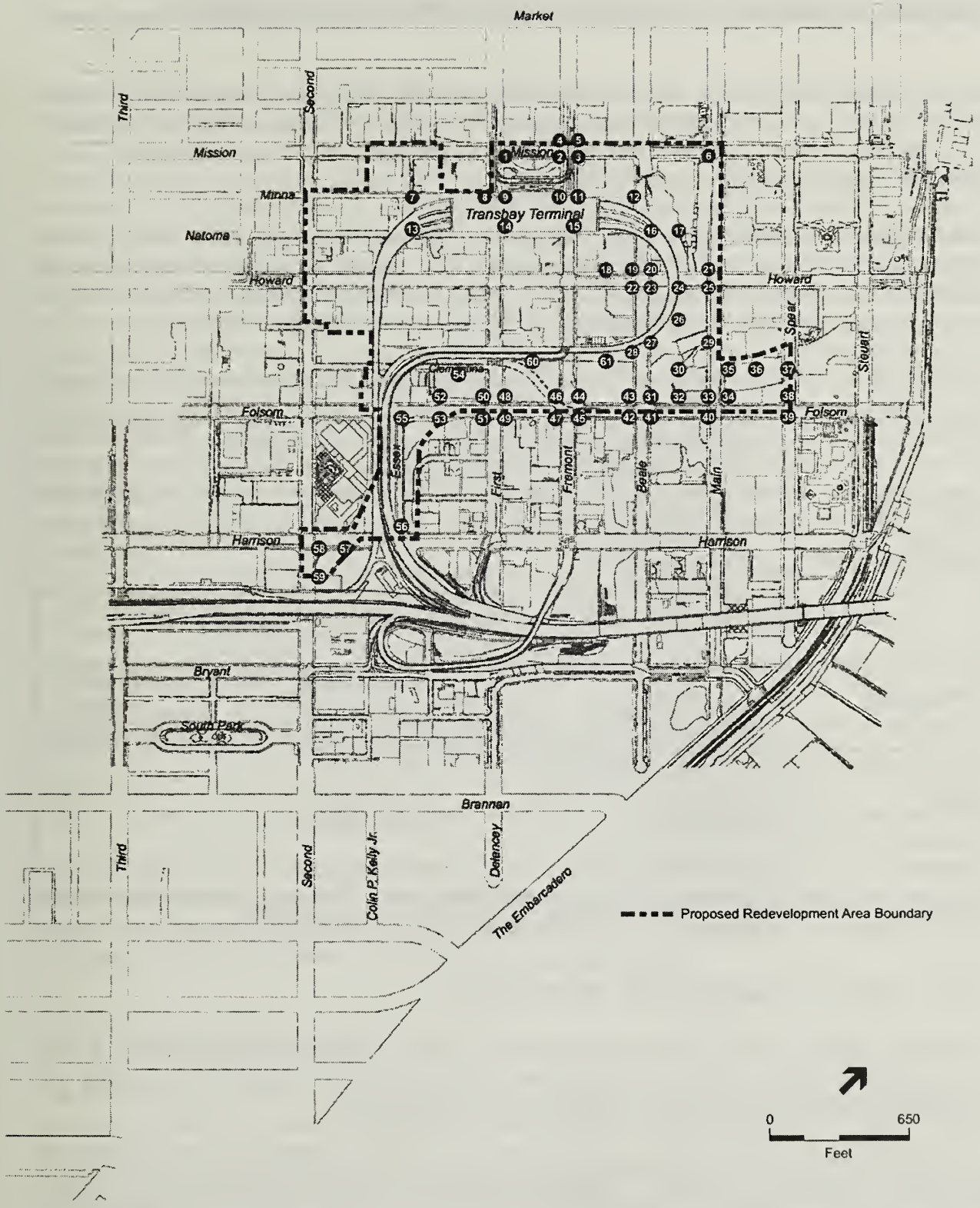
[1] For purposes of this analysis, local north-south runs along Second Street and parallel streets, and east-west runs along Mission Street and parallel streets. Wind directions will refer to true compass directions.

[2] Note that in describing the wind test locations for the four subareas, some points were referred to in more than one group.




SOURCE: Environmental Science Associates

*Transbay Terminal/Caltrain Downtown Extension / 201050* ■

**Figure 5.1-4**
Wind Test Point Location Map

**Mission, Main, Folsom, and Beale Streets Wind Study Subarea.** Winds would increase slightly compared to existing conditions, ranging from two mph (No. 30) to eight mph (Nos. 22, 24, 25, 29, 31). Of the 17 points in this subarea, all would continue to meet the Planning Code's pedestrian-comfort criterion value of 11 mph.

**Folsom Street Wind Study Subarea.** Winds would continue to be moderate to windy, and would range from two mph (No. 30) to 14 mph (No. 52). Of the 31 points in this subarea, 26 would continue to meet the Planning Code's pedestrian-comfort criterion value of 11 mph. Table 5.1-2 identifies the five test sites at which the comfort criterion would be exceeded.

**Essex Street Wind Study Subarea.** Winds would substantially increase in some portions of this area, with speeds ranging from nine mph (No. 55) to 18 mph (No. 57). Of the six points in this subarea, only one would continue to meet the Planning Code's pedestrian-comfort criterion of 11 mph. One site (No. 57) would exceed the hazard criterion, for a total duration of one hour per year. Site No. 57 is west of Essex Street just east of the intersection of Harrison and Second Streets. Table 5.1-2 identifies the test sites at which the comfort and/or hazard criteria are exceeded.

**Table 5.1-2: Full Build Alternative Exceedences of Comfort and Hazard Criteria**

| Wind Study Subarea | Location | Locations with Exceedence of Comfort Criterion | Locations With Exceedence of Hazard Criterion |
|---|---|---|---|
| Folsom Street Subarea | South sidewalk of Folsom Street | Nos. 42, 49, 53 | - |
| | North sidewalk of Folsom Street | Nos. 48 and 52 | - |
| Essex Street Subarea | East of Essex Street | Nos. 53 and 56 | - |
| | West of Essex, near Second Street | Nos. 57, 58, and 59 | No. 57 |

**Source:** Environmental Science Associates, Wind Study Technical Memorandum, 2001

### 5.1.2.3 Reduced Scope Alternative, Wind Impacts

Under this Alternative, development would result in greater building heights and massing than under existing conditions. This variant assumes that new buildings would be slightly taller and more slender than those associated with the Full Build Alternative.

Wind conditions would be considered moderate to windy, with an average of 6.8 mph (for all 61 test points). This is approximately 0.2 mph lower than the average for the Full Build Alternative conditions. Wind speeds in the pedestrian areas would range from three mph (Nos. 8, 9, 12, 14, 15, 17, 26, 31-33, 50) to 18 mph (No. 57). Wind speeds of 14 mph or higher would occur at four locations (Nos. 52, 57-59). Under this Alternative, the highest wind speeds would continue to

occur at the same location as under the Full-Build Alternative (No. 57) just east of the intersection of Harrison and Second Streets, with a speed of 18 mph.

Wind conditions under this Alternative would be very similar to those under the Full-Build Alternative. Fifty-four of the 61 test sites would meet the Planning Code's pedestrian-comfort criterion value of 11 mph. This option would exceed the comfort criterion at a total of seven locations, two fewer than under the Full-Build Alternative. Six of these locations (Nos. 49, 52, 53, 57-59) would also experience exceedences under the Full-Build Alternative. The seventh exceedence is located at test site number 60, as shown in Table 5.1-3. With this Alternative, the wind hazard criterion would remain exceeded for one hour per year at the point just east of the intersection of Harrison and Second Streets (No. 57).

**Table 5.1-3: Reduced Scope Alternative Exceedences of Comfort and Hazard Criteria**

| Wind Study Subarea | Location | Locations with Exceedence of Comfort Criterion | Locations With Exceedence of Hazard Criterion |
|---|---|---|---|
| Folsom Street Subarea | South sidewalk of Folsom Street | Nos. 49 and 53 | - |
| | North sidewalk of Folsom Street | No. 52 | - |
| | Between Folsom and Tehema St. | No. 60 | - |
| Essex Street Subarea | East of Essex Street | No. 53 | - |
| | West of Essex, near Second Street | Nos. 57, 58, and 59 | No. 57 |

**Source**: Environmental Science Associates, Wind Study Technical Memorandum, 2001

#### *5.1.2.4 Draft Transbay Redevelopment Area Design for Development Vision (August 2003)*

*Because the Design for Development Vision would construct an overall less intense (in terms of square footage) and less dense (in terms of the number of towers and more slender aspect of the towers) development program, wind effects would be less or essentially the same as those analyzed for both the Full Build and Reduced Scope Alternatives.*

#### 5.1.2.5 No-Project Alternative

The No-Project Alternative would result in less total development between the present and the horizon year 2020 than under the Full Build and Reduced Scope alternatives. The No-Project Alternative would be expected to have fewer tall buildings and thus fewer areas with increased ground level winds than the other alternatives considered. The wind conditions expected with this alternative would be expected to be similar or less substantial increases than those described under either build alternative.

#### 5.1.2.6 Mitigation Measures

During the environmental review process that would precede the approval of any individual project proposed for the proposed Transbay Redevelopment Area, potential wind effects of that project shall be considered and, if necessary, wind tunnel testing shall be performed in accordance with City Planning Code Section 148. If exceedences of the wind hazard criterion should occur for any individual project, design modifications or other mitigation measures would be required to mitigate or eliminate these exceedences. Mitigation measures would need to be tailored to the individual needs of each project. Examples of mitigation measures that could be used include articulation of building sides and softening of sharp building edges.

### 5.1.3 Shadows

Shading impacts were evaluated for the Redevelopment Plan Alternatives using the two massing scenarios described in Section 5.1.2, above. The analysis included the shadow effect of the proposed Transbay Terminal, determined by using the 60-foot height of the West Ramp Alternative (worst-case shadow) for both Transbay Terminal Alternatives (West Ramp or Loop Ramp). Shadow effects attributable to the project were analyzed for representative times of day (9 a.m., 12 noon, and 3 p.m.) during the four seasons of the year: in December on the winter solstice, when the sun is at its lowest and shadows are at their longest; and in June on the summer solstice, when the sun is at its highest and shadows are at their shortest; at the spring equinox, when shadows are midway through a period of shortening; and at the fall equinox, when shadows are midway through a period of lengthening. Shadows on any other day of the year would be within the range of shadows presented during the seasons and times of day described above.

Given the height limits for high-rise towers in the Reduced Scope and Full-Build alternatives, it appears that the project would conform to Section 295. That means the project would appear not to cast new shadow on any open space under the jurisdiction of the San Francisco Recreation and Park Commission within or outside of the study area between one hour after sunrise and one hour before sunset. However, the City would still require a shadow analysis application for each individual development proposal. The discussion below identifies the shadow effects that would occur on open space areas.

#### 5.1.3.1 Shading Impacts of the No-Project Alternative

The No-Project Alternative would result in a lesser total amount of development between now and 2020 than would the Full Build or Reduced Scope alternatives. Thus, the No-Project Alternative would be expected to have substantially less shadow effect than either of these two alternatives. Subsequent development projects greater than 40 feet in height would be subject to project-specific shadow analyses. No mitigation is indicated.

### 5.1.3.2 Shading Impacts of the Full-Build Alternative

The new shading caused by the project would not appear to affect open spaces protected by Section 295 of the Planning Code, such as South Park or South Beach Park. Future development would also be regulated by Sections 146 and 147 of the Planning Code, which protect sunlight access to streets and sidewalks and provide for reduction of shadows on public and publicly accessible open spaces within the C-3 districts. However, some publicly accessible, privately owned open spaces would be expected to see an increase in shading during certain periods of the day and the year, as described below.

**Spring.** In spring, new project shadow would generally fall in a northwesterly direction during the morning. Shadow from the proposed towers would extend from the southeast corner of Folsom Street to shade much of First, Fremont, Beale, and Main Streets to Howard Street. Surface parking on the south side of Howard Street could be shaded in the morning hours by proposed towers on Folsom Street.

At noon in spring, project shadows would be relatively short and would fall to the north. The Transbay Terminal shadow would cover Minna Street and the east side of Beale Street near the Terminal, as well as shading the proposed plaza area in front of the Terminal on Mission Street. New shadows cast from the proposed towers along Folsom Street would fall mid-block between Folsom and Howard Streets, shading less of First, Fremont, Beale, and Main Streets than they would have during the morning hours. To the east, new project shadow from the towers on Howard Street would shade Main Street from Folsom to Mission Streets.

During the afternoon hours, new shadows would lengthen and be cast more easterly. New shadows from the hotel and Transbay Terminal would fall mid-block on Assessor's Block 3718, which lies just east of the Transbay Terminal at Beale and Howard Streets. New shadows from the towers along Folsom Street would reach Folsom Street in the late afternoon. Under the Full Build Alternative, shadows would extend east just past the intersection of Steuart and Folsom Streets; under the Reduced Scope Alternative, shadows would also extend toward Steuart Street, but would fall short of the intersection.

**Summer.** During the summer solstice morning hours, shadows would fall to the west. Minna Street, directly north of the Transbay Terminal, would be in shadow. The Transbay Terminal would shade a portion of Mission Street between First and Fremont Streets, and the shadow would extend halfway to Market Street. New shade would be added to a portion of Howard Street between Main and Beale Streets. The southerly half of the block on Folsom Street between Essex and First Streets would also be newly shaded during morning hours.

During midday, relatively little new shading would occur, but would be in a northerly direction. Small portions of First, Fremont, Beale, Main and Spear Streets would be newly shaded by the proposed towers on Folsom Street.

During the late afternoon, shadows would fall to the east. New shading would occur along Folsom Street fronting the project towers. Shadows from the proposed towers would be longer and cross over the southern side of Folsom, specifically at Beale and Main Streets, but allow sunlight to reach the street. Guy Place would be shaded in the late afternoon hours from the proposed development on the corner of Folsom and Essex Streets.

**Autumn.** By the fall equinox, the position of the sun is lower in the sky, causing shadows to be longer. During the mid-morning through midday, new shadow caused by the project would extend generally northwest. The Transbay Terminal would create new shade on small sections of First and Fremont Streets, just south of Mission Street. New shadows from towers on Howard Street would cover Beale Street between Mission and Howard Streets. The northern half of First, Fremont, Beale, and Main Streets, between Folsom and Howard Streets, would be shaded by the proposed towers on Folsom Street. Because shadows would fall to the northwest, Folsom Street would generally not be shaded during the morning hours.

During midday, shadows would fall to the north. The proposed hotel in front of the Transbay Terminal would shade the intersection of Mission and Fremont Streets. The Transbay Terminal would shade the plaza in front of the Terminal. Along Howard Street, only the section between Beale and Main Streets would experience new shading. Along Folsom Street, shadow from the proposed towers on Folsom Street would be cast to the north, away from Folsom Street, but would fall on private mid-block open spaces just north of those project towers.

In the late afternoon hours, shadows would fall generally to the east. Folsom Street would be shaded both on the north and south sides of the street. Shadows cast by the proposed towers on Folsom Street would extend eastward to the intersection of Folsom and Spear Streets. The proposed high-rise on Folsom and Essex Streets would cast shadows in an easterly direction and partially shade Guy Place.

**Winter.** During the morning hours, the new shadows cast by the project would extend their farthest northwest during the winter season. Considerable shadowing occurs under existing winter conditions, so relatively little new shadow would be cast on the streets and sidewalks. To the north, the Transbay Terminal, the hotel and other project towers, would cast new shadows on Mission Street that would reach almost halfway up the block on First and Fremont Streets. New shadow would fall on both the north and south side of Howard Street, between Beale and Main Streets. In the morning, Folsom Street would not be shaded by the new development, except for new shadow that would occur between Essex and First Streets. New shadows cast by the proposed towers along Folsom Street would fall to the northwest and would shade mid-block throughways and planned open spaces, but would not shadow Folsom Street.

At midday, shadows would be cast to the north. New towers would shade interior block spaces along Folsom between First and Spear Streets. Shadows would reach east to the Gap Building. In the late afternoon hours, shadows would lengthen and reach their easternmost extent. With the exception of the shadow from the proposed towers along Folsom Street, new shadow would be minimal in the area due to the extensive existing shadow. Shadows from most new towers

would generally be cast on adjacent towers and not reach the street. However, in the late afternoon, shadows from the tower proposed at the corner of Folsom and Spear Streets could reach the planned Rincon Park and shade a small southern portion of the park.

#### 5.1.3.3 Shading Impacts of the Reduced Scope Alternative

The effects of this alternative would be very similar to those of the Full-Build. The following discussion identifies specific locations in which the impacts differ.

**Spring.** In the late afternoon, new shadows from the towers along Folsom Street would reach Folsom Street and extend east toward Steuart Street, but would fall short of the intersection between Folsom and Steuart Streets. (This intersection would be in shadow under the Full-Build Alternative.)

**Summer.** During the late afternoon, shadows would fall to the east. Under the Reduced Scope Alternative, shadows from the Transbay Terminal and the proposed redevelopment would add new shadow on Howard Street between Beale and Main Streets. Shadows from the proposed towers along Folsom Street would generally not extend as far south (i.e., would not cross Folsom Street) as under the Full Build scheme, but greater lengths of Folsom Street would be shaded.

**Autumn.** The effects of the Reduced Scope Alternative would be identical to those of the Full-Build Alternative.

**Winter.** The effects of the Reduced Scope Alternative would be identical to those of the Full-Build Alternative.

#### *5.1.3.4 Shading Impacts of the Draft Transbay Redevelopment Area Design for Development Vision (August 2003)*

*Because the Design for Development Vision would have fewer towers and because those towers would be taller and more slender than those of the Full Build Alternative, shadowing effects would be generally less than those of the Full Build Alternative and more similar to those of the Reduced Scope Alternative. No adverse effects to sites under the control of the Recreation and Parks Department would found. Therefore, these shading effects would not be adverse.*

## 5.2 DISPLACEMENTS AND RELOCATION

### 5.2.1 No-Project Alternative

No residential or non-residential displacements would occur directly as a result of the No-Project Alternative. Therefore, this section focuses on the displacement effects of the proposed Transbay Terminal, Caltrain Downtown Extension, and Redevelopment Plan.

### 5.2.2 Transbay Terminal

Properties to be acquired for construction of the Transbay Terminal are shown in Table 5.2-1. These properties are shown as blue on Figures 5.2-1, 5.2-2 and 5.2-3. *Movement of the Transbay Terminal footprint to the west would require the acquisition of four additional properties for the terminal. These properties were formerly identified in the Draft EIS/EIR as necessary acquisitions under both Caltrain Extension Alternatives, so the properties were anticipated to be acquired for the Project in any event. The properties are now required for the terminal rather than the Caltrain Extension and are shown in the table in italics.*

**Table 5.2-1: Property Acquisitions for the Transbay Terminal Alternatives**

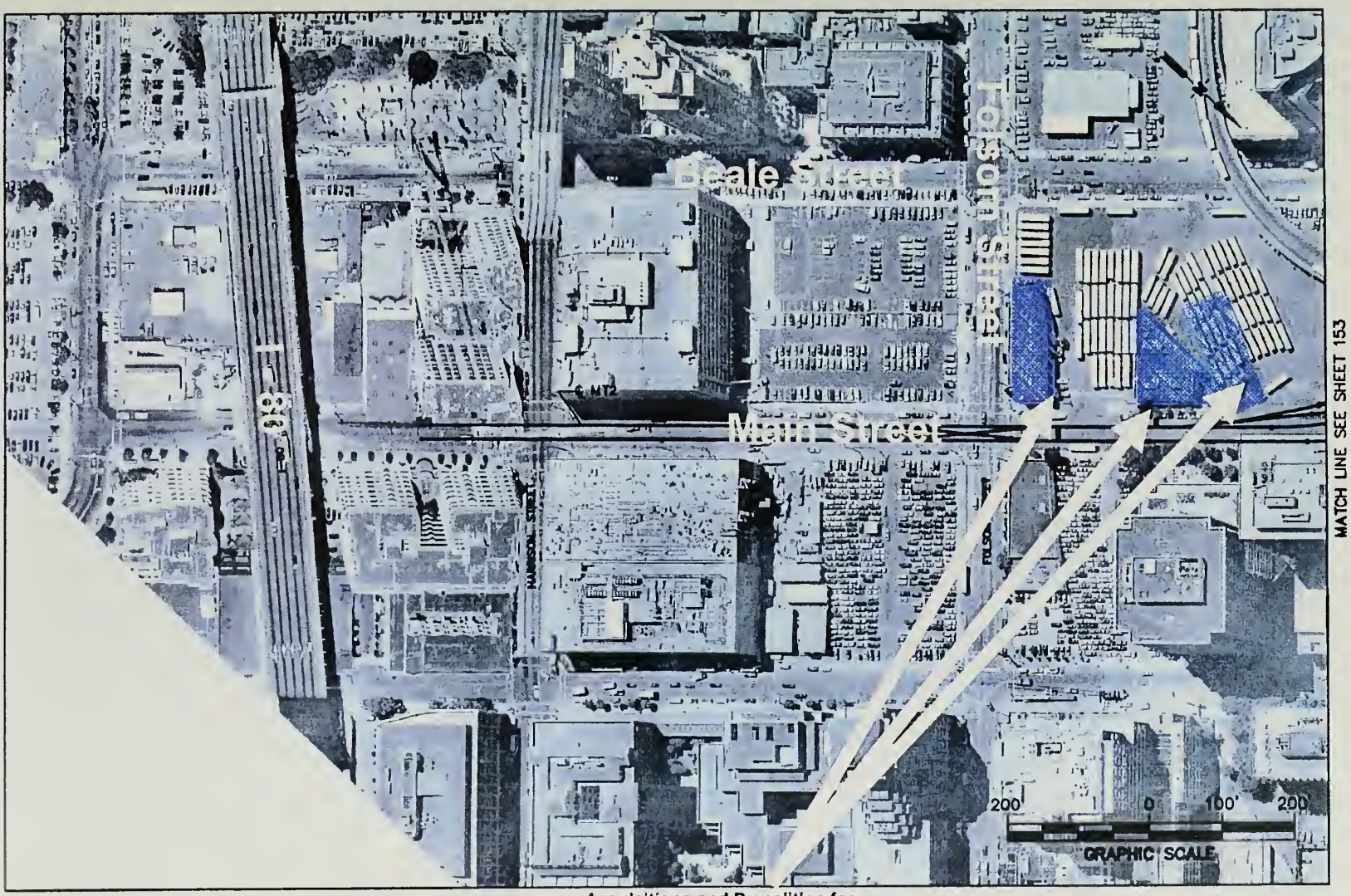
| Block & Lot Number | | Address |
|---|---|---|
| **Full Acquisitions** | | |
| *3721* | *45A* | *70 Natoma Street [a]* |
| *3721* | *46* | *78-80 Natoma Street [a]* |
| *3721* | *53* | *81 Minna Street [a]* |
| *3721* | *54* | *65 Minna Street [a]* |
| *3736* | *74* | *57 Tehama [b]* |
| 3739 | 2 | Vacant lot on Main Street |
| 3739 | 6 | 272 Main Street |
| 3739 | 4 & 7 | 200 Folsom |
| 3736 | ~~46~~ | 60 Tehama |
| **Partial Acquisitions** | | |
| 3721 | 16 | 546 Howard<br>Few feet from northeast corner of building |
| 3719 | 17 | *101-129* Fremont Street<br>(Southern portion of this parcel near the Transbay Terminal) |

*Notes:*

*[a] Assumed for acquisition as part of the Caltrain Extension in the Draft EIS/EIR. Now assumed for acquisition as part of the Transbay Terminal in this Final EIS/EIR due to proposed movement of the terminal to the west.*

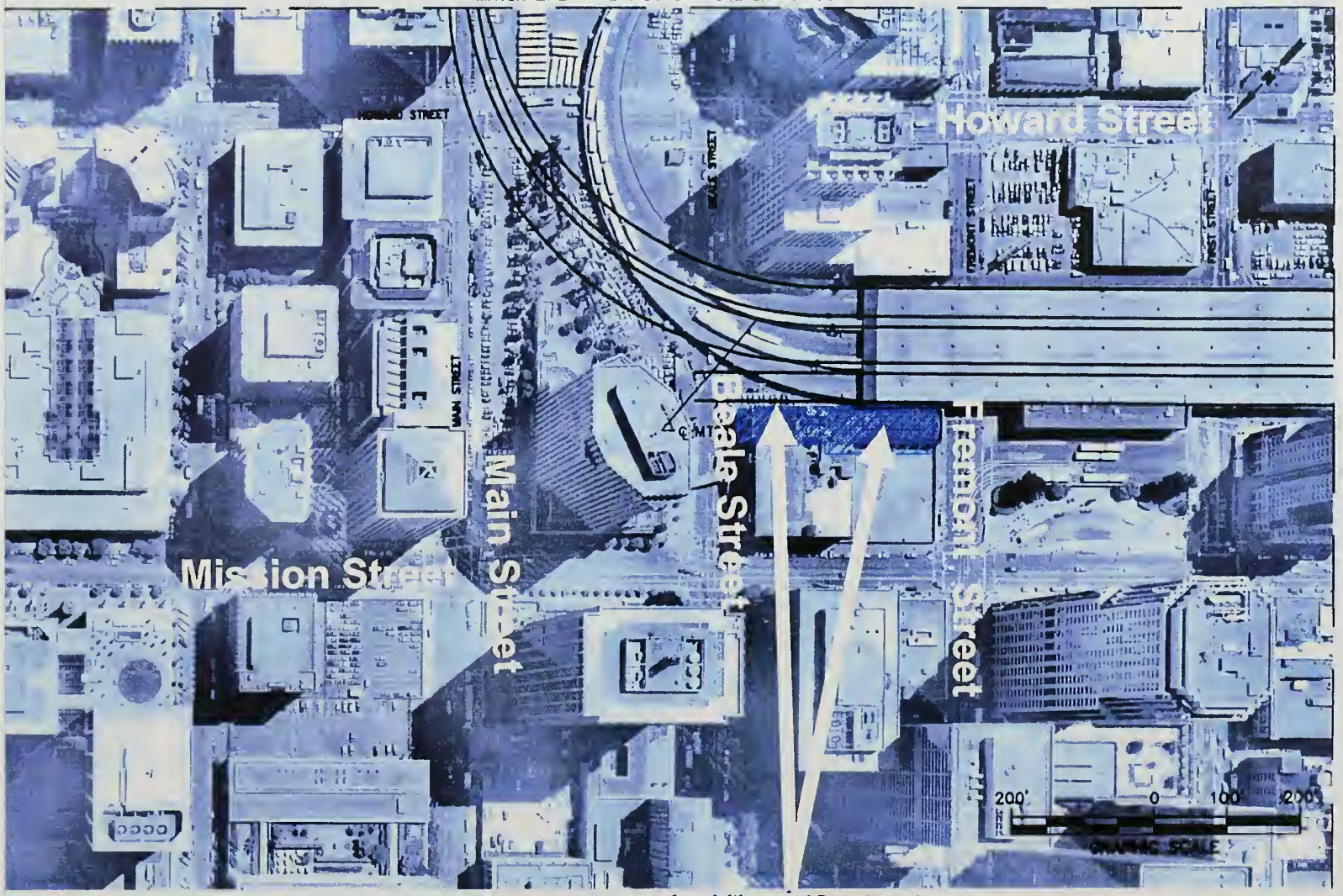
*[b] Additional property required for acquisition due to the necessary revisions between the Draft and Final EIS/EIR regarding the permanent bus ramp to the terminal.*

Source: Sedway Group, Parsons, 2004.




Acquisitions and Demolition for
Transbay Terminal

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DATE FLOWN SEPTEMBER, 2000 | J. TENNYSON | Property Acquisitions for Transbay Terminal | PARSONS | Caltrain | D. MAXEY | PENINSULA CORRIDOR JOINT POWERS BOARD | CDTXIPROP 021902 |
| SUBJECT TO CHANGE DURING FINAL DESIGN | K. LD | | | | Z. AMARE | Figure 5.2-1 | 1"=200' |
| | D. MANSEN | | | | B. SUSANTO | | 154 |
| | D. WEMMER | | | | | | |




Acquisitions and Demolition for
Transbay Terminal

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DATE FLOWN: SEPTEMBER, 2000 | DESIGNED: J. TENNYSON; DRAWN: K. LEI; CHECKED: D. MANSEN; IN CHARGE: W. SCHAFER | Property Acquisitions for Transbay Terminal | PARSONS | Caltrain | CHIEF ENGINEER: D. MAXEY; DESIGN OVERSIGHT; OPERATIONS OVERSIGHT: J. FICARRA; SAFETY/SECURITY: C. PAYNE | PENINSULA CORRIDOR JOINT POWERS BOARD | CADD FILE NO: CDTX1PROP; CADD DATE: 110901; SCALE: 1" = 200'; CONTRACT NO; MILEPOST; DWG NO: 153; REV; PAGE NO |
| SUBJECT TO CHANGE DURING FINAL DESIGN | | | | | | Figure 5.2-2 | |

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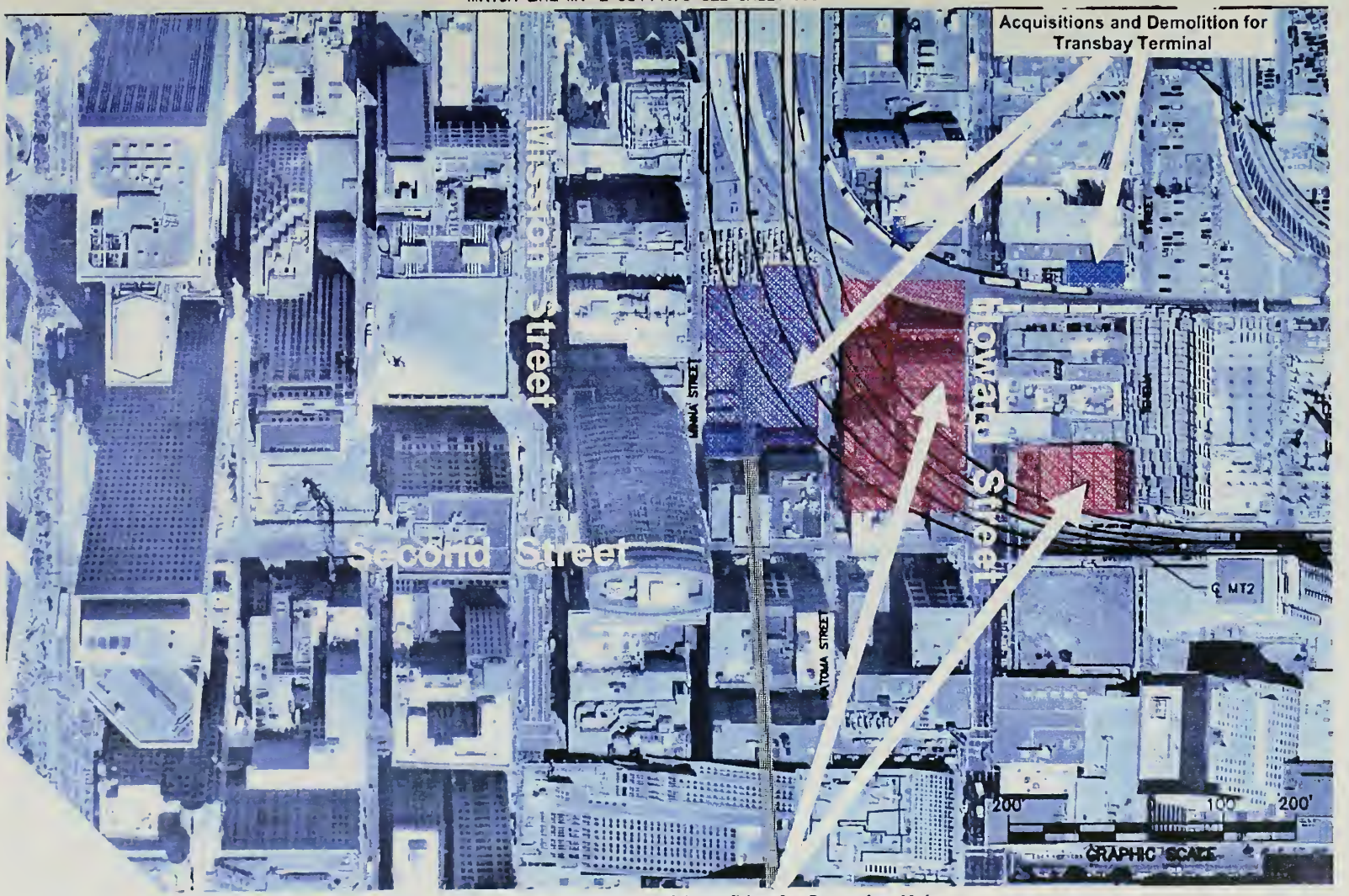



Acquisitions and Demolition for Second-to-Main Caltrain Extension Alternative

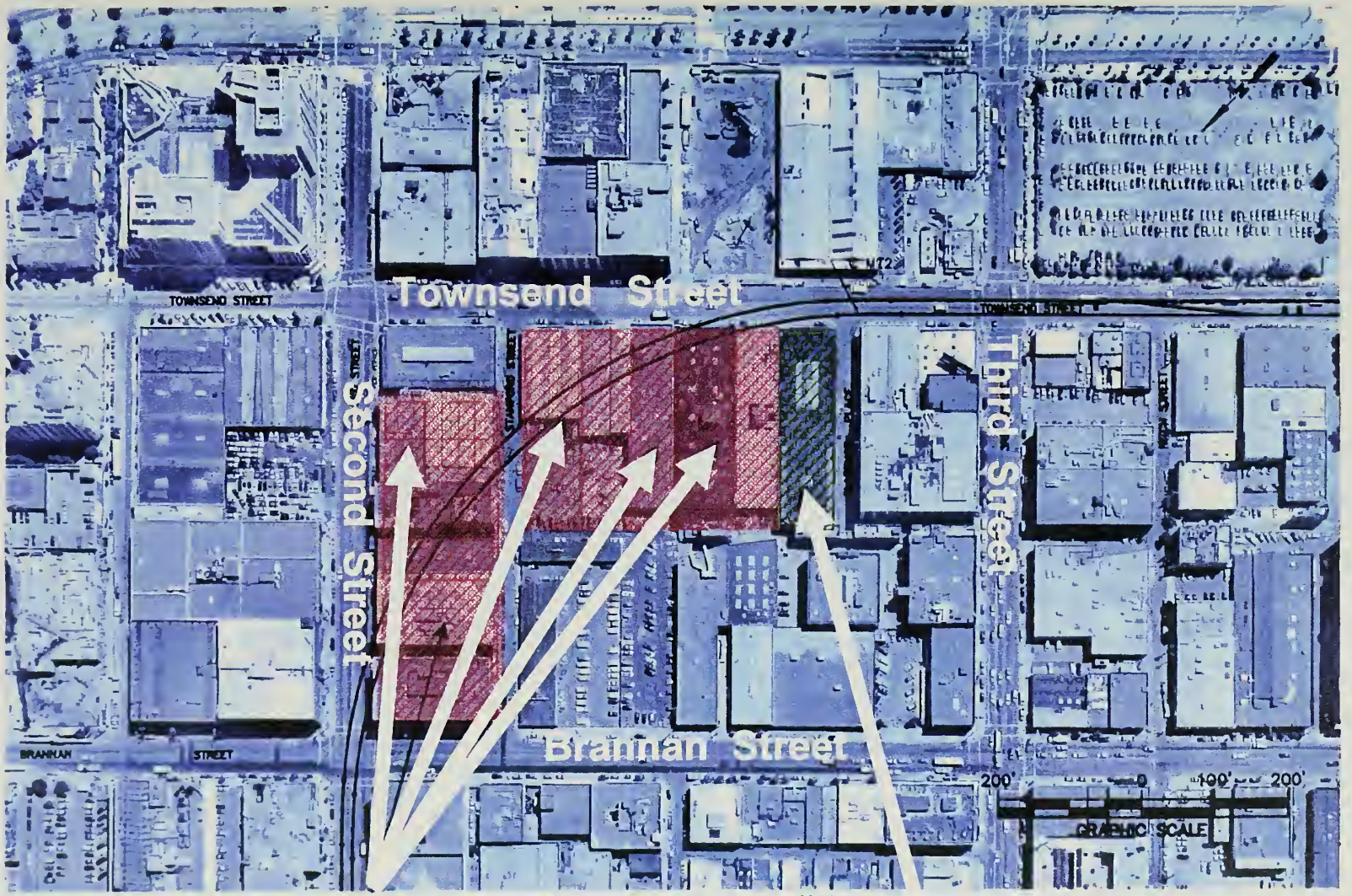
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DATE FLOWN SEPTEMBER, 2000 | DESIGNED J. TENNYSON | Property Acquisitions for Transbay Terminal and Second-to-Main Caltrain Extension Alternative | PARSONS | Caltrain | CHIEF ENGINEER D. MAXEY | PENINSULA CORRIDOR JOINT POWERS BOARD | CADD FILE NO. CDTXIPROP / CADD DATE 110901 |
| SUBJECT TO CHANGE DURING FINAL DESIGN | DRAWN K. LO | | | | DESIGN OVERSIGHT | Figure 5.2-3 | SCALE 1"=200' |
| | CHECKED D. MANSEN | | | | OPERATIONS OVERSIGHT J. FICARRA | | CONTRACT NO. / MILEPOST |
| | W. CHANGE W. SCHAFER | | | | SAFETY/SECURITY C. PAYNE | | DWG NO. 152 / REV / PAGE NO. |
| | DATE | | | | | | |

*An additional property would be required for the permanent bus ramp. This property – Block 3736, Lot 74 (57 Tehama Street) – was not identified in the Draft EIS/EIR. The additional property is required due to necessary revisions to the permanent bus ramp resulting from: (1) responses to comments from Caltrans on the Draft EIS/EIR regarding the ramp structure shown in the Draft EIS/EIR, and (2) movement of the terminal to the west. This additional property is also shown in the table in italics.*

### 5.2.3 Caltrain Downtown Extension

Properties that would need to be acquired or for which an underground easement would be required for either Caltrain Downtown Extension Alternative are shown in Table 5.2-2 and on Figure 5.2-4. Acquisition and demolition of these properties would occur for the Cut-and-Cover Option. Underground easement would be required for these properties for the Caltrain Extension Tunneling Option. *A construction easement will also be required for a portion of the private property (southern portion of Block 3718 – Lot 025) associated with 201 Mission Street, namely the parking area and access road to the loading docks for this structure. Temporary access will be provided from Main Street to the loading area for this structure during the construction period for the Caltrain Extension tail tracks.*

Properties that would need to be acquired and demolished for each of the Caltrain Downtown Extension Alternatives are shown in Tables 5.2-3 and 5.2-4. Properties shown as red on Figure 5.2-3 would be acquired for the Second-to-Main Alternative. Properties shown in red on Figures 5.2-5 and 5.2-6 would be required for the Second-to-Mission Alternative.




Acquisitions and Demolition for Cut-and-Cover Option
or Underground Easements for Tunnel Option

Underground Easement for
Cut-and-Cover or Tunnel Option

| | | | | | | |
|---|---|---|---|---|---|---|
| DATE PLOTTED: SEPTEMBER, 2000 | DESIGNED: J. TENNYSON; DRAWN: K. LEI; CHECKED: D. MANSEN; IN CHARGE: W. SCHAFER | Property Acquisitions and Demolition for Caltain Extension Cut-and-Cover Option or Easements for Tunnel Option | PARSONS | Caltrain | CHIEF ENGINEER: D. MAXEY; DESIGN OVERSIGHT; OPERATIONS OVERSIGHT: J. PICARRA; SAFETY/SECURITY: C. PAYNE | PENINSULA CORRIDOR JOINT POWERS BOARD<br>Figure 5.2-4 | EADD FILE NO: COTXIPROP; EADD DATE: 110901; SCALE: 1"=200'; CONTRACT NO; MILEPOST; DRG NO: 151; REV; PAGE NO |

SUBJECT TO CHANGE
DURING FINAL DESIGN

**Table 5.2-2: Properties to be Acquired or Underground Easement Properties**
(Either Second-to-Main or Second-to-Mission Caltrain Extension Alternative)

| Block and Lot Number | | Address |
|---|---|---|
| **Acquisitions and Demolition or Underground Easement [1]** | | |
| 3788 | *74 through 85* | 164 Townsend Street |
| 3788 | 10 | 148-154 Townsend Street |
| 3788 | 9A | 144-146 Townsend Street |
| 3788 | 9 | 136 Townsend Street |
| 3788 | 8 | 130 Townsend Street |
| 3788 | 43 | 670 Second Street |
| 3788 | 44 | 678-80 Second Street |
| 3788 | 49 to 73 | 650 Second Street |
| 3788 | 2 | 640 Second Street |
| 3788 | 38 | 35 Stanford Street |
| 3788 | 37 | 301 Brannan Street |
| **Underground Easement for Either Cut-and-Cover or Tunneling Option** | | |
| 3788 | 12 | 166-178 Townsend Street |
| ***Temporary Construction Easement (Second-to-Main Alternative – Locally Preferred Alternative)*** | | |
| *3718* | *025* | *201 Mission (southern portion of site)* |

*Notes:*
*[1] Properties listed would be acquired and demolished under the Cut-and-Cover Option. For the Tunneling Option, underground easement would be required for the listed properties.*

***Source:*** *Sedway Group, Parsons, 2004.*

**Table 5.2-3:**
**Property Acquisitions & Demolitions**
**Second-to-Main**
**Caltrain Extension Alternative**

| Block & Lot Number | | Address |
|---|---|---|
| 3736 | 95 | 217 Second Street |
| 3736 | 96 | 205-215 Second Street |
| 3736 | 97 | 201 Second Street |
| 3721 | 22 | 191Second Street |
| 3721 | 23 | 181 Second Street |
| 3721 | 25 | 171 Second Street |
| 3721 | 47 | 90 Natoma Street |
| 3721 | 95 | 580-586 Howard Street |
| 3721 | *108* | 81-83 Natoma Street |
| 3721 | *109 through 118* | 85 Natoma Street |
| 3721 | 29 | 77-79 Natoma Street |
| 3721 | 20 | 568-576 Howard Street |
| 3721 | 31 | * Natoma Street |

**Notes:**
* indicates no address listed

**Source:** Sedway Group, Parsons Transportation Group, 2001.

**Table 5.2-4:**
**Property Acquisitions & Demolitions**
**Second-to-Mission**
**Caltrain Extension Alternative**

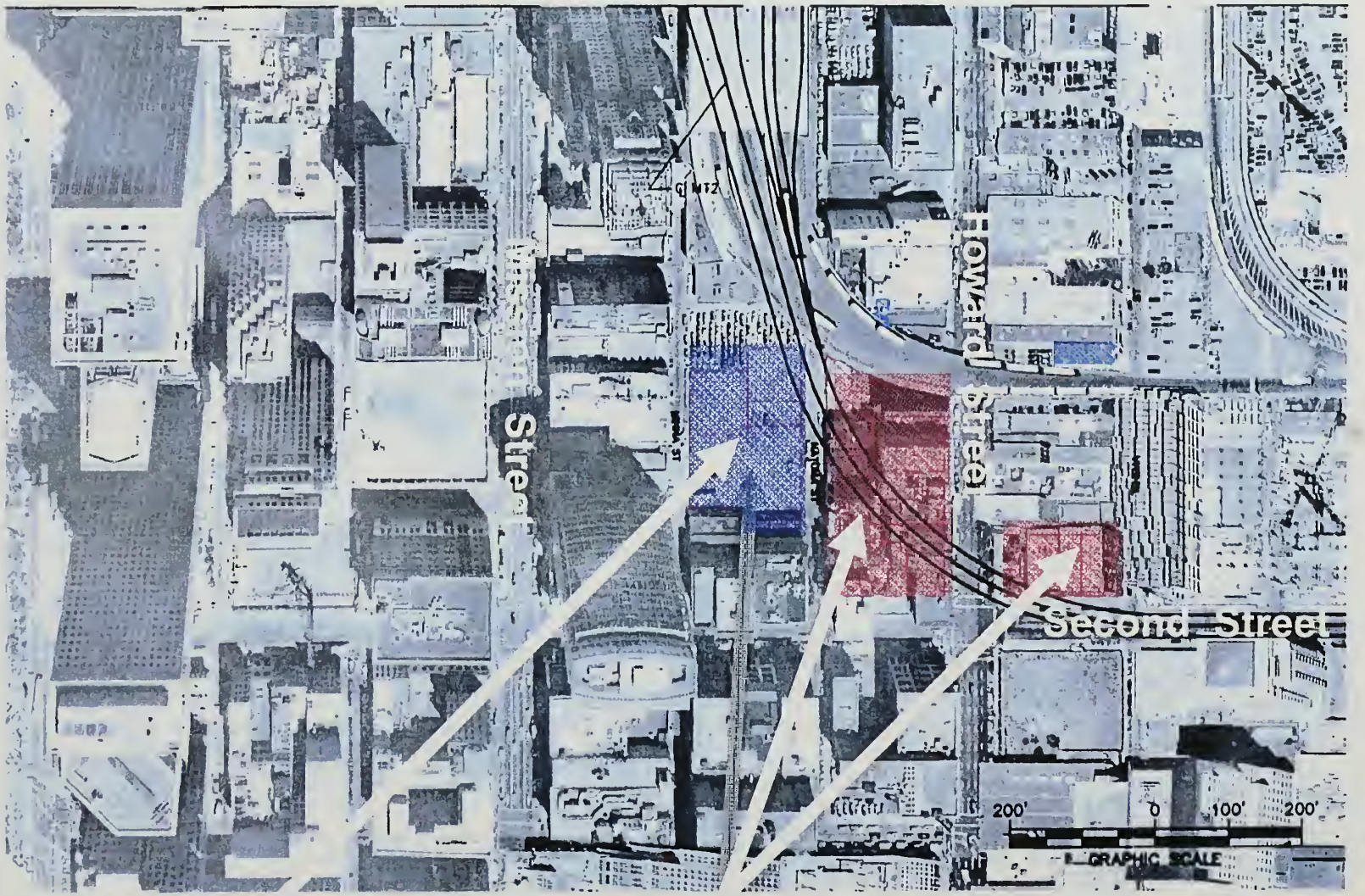
| Block & Lot Number | | Address |
|---|---|---|
| 3736 | 95 | 217 Second Street |
| 3736 | 96 | 205-215 Second Street |
| 3736 | 97 | 201 Second Street |
| 3719 | 1 | 301-315 Mission Street (northern portion) |
| 3719 | 17 | 101-129 Fremont Street |
| 3721 | 22 | 191 Second Street |
| 3721 | 23 | 181 Second Street |
| 3721 | 25 | 171 Second Street |
| 3721 | 47 | 90 Natoma Street |
| 3721 | 95 | 580-586 Howard Street |
| 3721 | *108* | 81-83 Natoma Street |
| 3721 | *109 through 118* | 85 Natoma Street |
| 3721 | 29 | 77-79 Natoma Street |
| 3721 | 20 | 568-576 Howard Street |
| 3721 | 31 | * Natoma Street |

**Notes:**
* indicates no address listed

**Source:** Sedway Group, Parsons Transportation Group, 2004

### 5.2.4 Transbay Redevelopment Plan

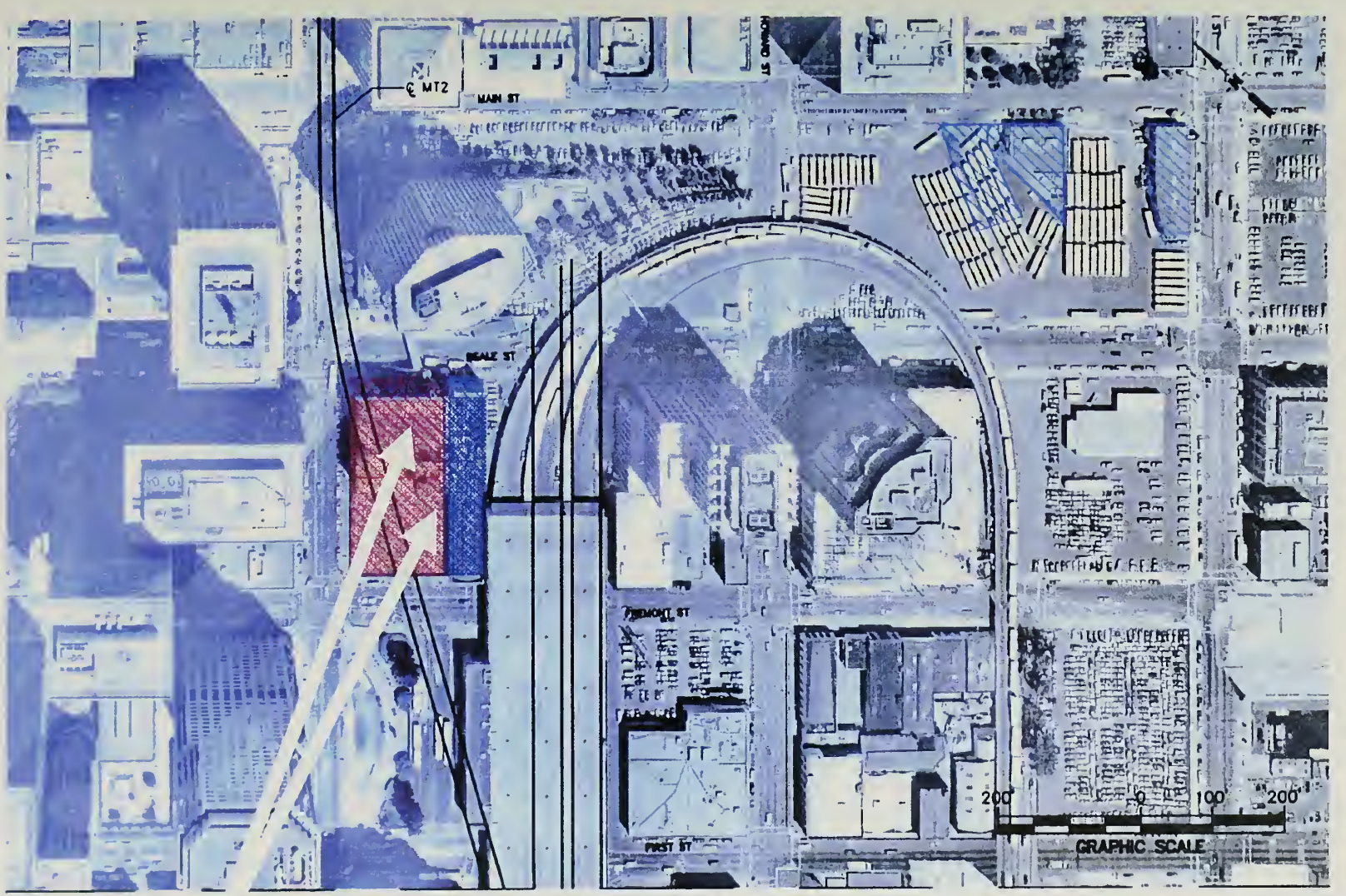
Properties identified for redevelopment as part of the Redevelopment Plan are principally occupied by surface parking. Impacts to parking are discussed in Section 5.19.5.




Property Acquisitions & Demolition for Transbay Terminal

Property Acquisitions & Demolition for Second to Mission

| | | | | | | |
|---|---|---|---|---|---|---|
| DATE FLOWN: SEPTEMBER, 2000<br>SUBJECT TO CHANGE DURING FINAL DESIGN | J. TENNYSON<br>K. LEI<br>D. MANSEN<br>W. SCHAFER | Property Acquisition for Second-to-Mission Caltrain Extension Alternative | PARSONS | Caltrain | D. MAXEY<br>J. FICARRA<br>C. PAYNE | PENINSULA CORRIDOR JOINT POWERS BOARD<br>Figure 5.2-5 | CADD FILE NO: CDTX2PROP<br>CADD DATE: 110901<br>SCALE: 1"=200'<br>DWG NO: 252 |




Acquisitions and Demolition

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DATE FLOWN: SEPTEMBER, 2000 | DESIGNED: J. TENNYSON<br>DRAWN: K. LEI<br>CHECKED: D. MANSEN<br>IN CHARGE: O. WERNER<br>DATE: | Property Acquisition for Second-to-Mission Caltrain Extension Alternative | PARSONS | Caltrain | CHIEF ENGINEER: O. MAKEY<br>PROJECT MANAGEMENT:<br>STRUCTURES: Z. AMARE<br>TRACK / CIVIL: B. SUSANTO | PENINSULA CORRIDOR JOINT POWERS BOARD | CADD FILE NO: CDTX2PROP<br>CADD DATE: 021902<br>SCALE: 1"=200'<br>CONTRACT NO:<br>MILEPOST:<br>DWG NO: 253<br>REV: |
| SUBJECT TO CHANGE DURING FINAL DESIGN | | | | | | Figure 5.2-6 | |

### 5.2.5 Business and Residential Displacements

Field surveys and public records searches were performed to determine the potentially affected properties, the number and types of businesses occupying these properties, and the general character of the land uses. Businesses were consolidated into the following categories, as shown in Table 5.2-5: small or specialty retail, office/business services, restaurant/bar, industrial, warehouse, and parking. The estimated number of employees who may be displaced was determined from public business records or estimated by applying per-square-foot factors to the building areas of the affected properties. Estimates of affected employees are in full-time equivalents in all cases.

Because of the varied types of businesses in the SOMA, the high incidence of small specialty firms, and the relatively rapid changes in business activity, it is difficult to estimate accurately the number of businesses and employees that may be affected by acquisitions that would take place three to five years from now. The estimated acquisitions and displacements presented in this section are representative of conditions that may exist when the Transbay Terminal and Caltrain Downtown Extension would be implemented. Information would be updated during final design and during pre-construction surveys.

**Residential Displacement.** Construction of the Transbay Terminal and the Caltrain Downtown Extension could require acquisition of up to 60 residential units, including 14 live/work units. Twelve of these units have operating commercial businesses. Up to 120 persons per alternative would be relocated, assuming an average of two residents per unit.

**Business Displacement.** The Transbay Terminal and Caltrain Downtown Extension could displace up to 67 businesses, plus 12 businesses currently operating in the live/work units. Up to an estimated 1,600 respective employees could be displaced.

Federal and state laws require consistent and fair treatment of owners of properties to be taken, including just compensation for their properties. Uniform and equitable treatment of temporarily or permanently displaced businesses is also required by these laws. Acquisition costs are discussed in Section 5.6.

### 5.2.6 Relocation Resources

Acquisition of private properties required for the Caltrain Downtown Extension would represent a loss of up to 742,000 square feet of building space, of which up to 478,000 square feet is estimated to be office space; 127,000 square feet is estimated to be industrial space; 20,000 square feet is estimated to be retail/restaurant space; and 117,000 square feet is residential space.

**Table 5.2-5: Estimated Residential and Non-Residential Acquisitions for Transbay Terminal, Caltrain Downtown Extension and Redevelopment Program**

**RESIDENCES**

| Project Component/ Alternatives | No. of Properties Acquired | Total Est. Land Area in Sq. Ft. | Total Est. Building Sq. Ft. | Estimated Number of Residential Units Displaced by Type | | | | | Estimated Persons Displaced |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Total Single Family Units | Mobile Homes | Multi-Family | | Total | |
| | | | | | | Buildings | Units | | |
| **Transbay Terminal & Redevelopment Area** | No Residential Units Affected | | | | | | | | |
| **Caltrain Downtown Extension (Cut-and-Cover Option)** | | | | | | | | | |
| Second-to-Main | 4 | 41,000 | 117,000 | 0 | 0 | 4 | 60 | 60 | 120 |
| Second-to-Mission | 4 | 41,000 | 117,000 | 0 | 0 | 4 | 60 | 60 | 120 |
| **Caltrain Downtown Extension (Tunneling Option)** | | | | | | | | | |
| Second-to-Main | 2 | 14,000 | 50,000 | 0 | 0 | 2 | 23 | 23 | 46 |
| Second-to- Mission | 2 | 14,000 | 50,000 | 0 | 0 | 2 | 23 | 23 | 46 |

**BUSINESSES**

| Project Component/ Alternatives | No. of Properties Acquired | Total Est. Land Area in Sq. Ft. | Total Est. Building Sq. Ft. | Estimated Number of Businesses Displaced by Type | | | | | | | Estimated Employees Displaced |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Retail | Office/Bus. Services | Rest. / Bar | Industrial | Warehouse | Parking | Total | |
| **Transbay Terminal and Redevelopment Area** | | | | | | | | | | | |
| | 6 | 36,000 | 82,000 | 0 | 9 | 0 | 0 | 0 | 1 | 10 | 200 |
| **Caltrain Downtown Extension (Cut-and-Cover Option)** | | | | | | | | | | | |
| Second-to-Main | 25 | 224,000 | 433,000 | 6 | 32 | 0 | 2 | 1 | 3 | 48 | 1,084 |
| Second-to-Mission | 27 | 274,000 | 543,000 | 6 | 42 | 0 | 2 | 1 | 2 | 58 | 1,422 |
| **Caltrain Downtown Extension (Tunneling Option)** | | | | | | | | | | | |
| Second-to-Main | 16 | 81,000 | 146,000 | 5 | 29 | 0 | 0 | 0 | 2 | 40 | 425 |
| Second-to-Mission | 18 | 131,000 | 256,000 | 5 | 39 | 0 | 0 | 0 | 2 | 50 | 763 |

**Source:** Sedway Group, Parsons Transportation Group, 2001

Based on current market conditions for commercial and residential space, most businesses and residents should be able to be relocated within the study area. The study area is part of the broader South of Market Area (SOMA), which has witnessed a dramatic transformation over the past seven years with older buildings rehabilitated and new buildings constructed on previously vacant or underutilized parcels. This area was the epicenter of the "dot com" boom in 1999 and 2000, during which multimedia, technology, and Internet companies, fueled by venture capital, exhibited a healthy appetite for real estate. Correspondingly, vacancy rates plummeted, rents and sales prices spiked, and new development and redevelopment was widespread throughout SOMA.

However, by the end of 2000, stock market reductions hit the technology and Internet sector and space was increasingly placed on the market for sublease. In 2001, the overall economy has substantially slowed, affecting demand for space. As a result, vacancy rates have increased. The properties located at Second and Howard streets are within the South of Market Financial District office submarket, which posted a 12 percent vacancy on an inventory of 20.8 million square feet as of the end of September 2001. The properties located at Second and Townsend streets are in the SOMA South office submarket, which has been more severely affected by the downturn. As of September 2001, this market had a vacancy rate of 26 percent on a total inventory of 5.5 million square feet.

As demand for office space has deteriorated, so has demand for industrial and retail space. The residential market, while not as severely affected, has also experienced increasing vacancy rates, lowered rents, and, with respect to "for-sale" projects, lower sales prices and longer marketing periods. A recovery is expected, but may not commence until at least the end of 2002. An improvement in the market to the point of the extremely strong conditions experienced in 1999 and 2000 is not expected for a number of years. Therefore, displaced businesses and residents interested in relocating within SOMA would likely find an ample supply of comparable office, industrial, retail, or residential space.

The federal Uniform Relocation Act (Public Law 91-646) and the California Relocation Act (Chapter 16, Section 7260 et seq. of the Government Code) and related laws and regulations contain specific requirements that govern both land acquisition and relocation. All real property to be acquired *will* be appraised to determine its fair market value before an offer is made to each property owner. Minimum relocation payments are detailed in the laws, and include moving and search payments for businesses. For purposes of the relocation acts, parking lots are considered businesses.

The City and County of San Francisco and the *Transbay Joint Powers Authority will* provide information, assistance and payments to all displaced businesses in accordance with these laws and regulations.

## 5.3 SOCIOECONOMICS

### 5.3.1 No-Project Alternative

The No-Project Alternative would not directly affect residential or business access or the character of neighborhoods so as to adversely influence location choices or the local economy.

### 5.3.2 Transbay Terminal

Construction of the proposed Transbay Terminal would increase pedestrian activity and as a result would potentially contribute to the intensification of land uses and the redevelopment of underutilized parcels in the vicinity of the Terminal; thereby improving the economic vitality of the area.

Four nonresidential units would be displaced due to implementation of the Transbay Terminal. No residential units would be displaced by the Transbay Terminal component.

### 5.3.3 Caltrain Downtown Extension

The Caltrain Downtown Extension would provide improved access to the major employment center in the heart of downtown San Francisco, and therefore would enhance economic activity in this area.

Construction of the cut-and-cover tunnel configuration between Fifth Street and the Transbay Terminal would entail the acquisition and demolition of all existing buildings under which the Downtown Extension alternative alignments would pass. Following construction of the underground extension, however, it is anticipated that new buildings would be constructed as vacant sites become available for resale.

Construction of the Caltrain Downtown Extension Tunneling Option would involve fewer acquisitions and displacements. Specifically, underground easements would be required for the properties along Townsend and Brannan Streets and in the 600 block of Second Street, but these properties would not be demolished or vacated.

As described in Section 5.2.2, the Caltrain Downtown Extension Cut-and-Cover Option would displace up to 60 residential units, including 14 live/work units, with either the Second-to-Main or the Second-to-Mission alternatives. An estimate of up to 120 persons per alternative would be relocated, assuming an average of two residents per unit. All homeowners or renters displaced as a result of the project would be offered relocation assistance and replacement housing.

For the Cut-and-Cover Option, up to an estimated 58 businesses would be displaced for the Second-to-Mission Alternative. The lowest number of business displacements would occur for the Second-to-Main Tunneling Option, with an estimated 40 business displacements.

The City and County of San Francisco or the TJPA *will* acquire the properties, and each business owner *will* be offered relocation assistance. In the event the displaced businesses chose not to relocate within the area, a loss of jobs would result. The maximum number of jobs lost if no businesses relocated in the area is estimated to be between 425 for the Second-to-Main Tunneling Option to 1,422 jobs for the Second-to-Mission Cut-and-Cover Option.

In all likelihood, a number of the affected businesses would relocate nearby or elsewhere within the City and County of San Francisco. Also, other businesses might relocate or expand in the area, in part because of the general improvement in transportation facilities. As a result, net job loss attributable to the project would be minimal. Fiscal and economic impacts of residential and business displacements are discussed in Section 5.6.

### 5.3.4 Redevelopment Area Alternatives

The Redevelopment Area alternatives are expected to intensify the urban character of the area and to result in a more cohesive neighborhood with a balanced mixture of residential and commercial uses. Consequently, proposed development is anticipated to improve rather than to disrupt or adversely affect the character of the existing socioeconomic environment.

Displacement impacts *will* be mitigated in accordance with the relocation assistance programs summarized in Section 5.2, Displacements and Relocation. Since no other long-term impacts to residential populations, neighborhoods, community cohesion or land use patterns in the study area are anticipated, no further mitigation is suggested. Potential project impacts on community facilities and services, parklands, schools and churches are discussed in Sections 5.4, Community Facilities and Services, and 5.5, Parklands, Schools, and Religious Institutions.

### 5.3.5 Environmental Justice

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations), dated February 11, 1994, calls on federal agencies to identify and address disproportionately high and adverse human health or environmental effects of federal programs, policies, and activities on minority populations and low- income populations. In 1997, the U.S. Department of Transportation (DOT) issued its DOT Order to establish procedures for use in complying with EO 12898 for its operating administrations, including FTA.

Impacts and benefits of transportation projects result from the physical placement of such facilities, and also from their ability to improve or impede access to neighborhoods or portions of the region. This analysis examines whether ethnic minority and/or low-income populations in the project area would experience these types of impacts, and if they are inconsistent with the benefits created.

As noted in Section 4.2, the study area as a whole consists of relatively smaller percentages of ethnic and minority populations as compared to overall percentages for the City of San Francisco. Census Tract 180 at the west end of the study area, however, reveals higher concentrations of Black/African American and Hispanic populations relative to percentages citywide. With the exception of Census Tract 180, the percentage of residents below the federal poverty level was comparable to the citywide average. Auto ownership within the study area is slightly less than for the city as a whole.

The construction of the proposed Transbay Terminal, Caltrain Downtown Extension and Redevelopment Plan would have no long-term adverse effects on minority, low-income and transit dependent communities. As described above, the study area, particularly Census Tracts 176.02 and 179.01 where the majority of the project impacts would occur, has relatively lower percentages of minority and low-income populations as compared to the greater San Francisco area. Census Tract 180, where higher concentrations of minority populations occur, would have fewer project impacts. Minority populations are not disproportionately represented among those who would be displaced by the project or who would live adjacent to the project. Therefore, the project would have neutral environmental justice implications. The proposed project components would improve mobility for transit-dependent populations and would enhance intermodal connectivity. All transit services would remain continuous during the construction period. The proposed community revitalization and redevelopment plan, including the provision of affordable housing, would be an added benefit to the community.

## 5.4 COMMUNITY FACILITIES AND SERVICES

### 5.4.1 No-Project

Implementation of the No-Project Alternative would have no effect on existing community facilities and services. The demand for police protection, fire prevention, emergency medical services and waste management facilities as a result of No-Project development would be adequately accommodated through the horizon year 2020. Therefore, no impacts are anticipated with the implementation of the No-Project Alternative, and no mitigation measures are proposed.

### 5.4.2 Transbay Terminal

#### 5.4.2.1 Public and Community Facilities

None of the public and community facilities described in Section 4.3 would be displaced, relocated, or otherwise affected by construction of either of the Transbay Terminal Alternatives.

### 5.4.2.2 Safety and Emergency Services

**Police.** Implementation of either the West Ramp or the Loop Ramp Alternative would increase the amount of pedestrian activity within the Terminal and general vicinity, and thus the potential for crimes reported in the area. Currently, the Terminal falls under the jurisdiction of the California Highway Patrol, but this would change with the change in Terminal ownership and the TJPA would need to determine how it would obtain police services for the new Terminal. *According to Lieutenant Pardini of the San Francisco Police Department (SFPD), the SFPD's Southern Station does not have the sufficient personnel to realign its staff and provide offices exclusively for the Terminal.*[3] Southern Station currently has no patrol officers assigned to the Terminal. Sources at the Department anticipate that a minimum of two Southern Station patrol officers would *need to* be assigned (24 hours per day, seven days per week), and this increase in demand could *not* be met by reorganizing existing staff *and would require a funding arrangement between the terminal and SFPD.*

It is likely that some Terminal police and protection services would remain with the security forces associated with Terminal transit agencies, including AC Transit and Golden Gate Transit. It is anticipated that these agencies would extend their security responsibilities to accommodate the new Terminal under either the West Ramp or Loop Ramp Alternative.

**Fire and Emergency Medical Services.** The development of the Transbay Terminal at a height and massing greater than the existing Terminal, coupled with an increase in the intensity of land uses associated with the site would increase demand for fire prevention and suppression and emergency services under either of the new terminal alternatives (West Ramp or Loop Ramp). Demand for fire prevention and suppression and emergency services would be expected to be greater under the West Ramp Alternative due to the increased mix of land uses, including the pedestrian concourse level with retail, commercial, conference, and cultural uses.

To ensure that adequate life safety measures and emergency access *will* be incorporated into the design and construction of either of the design alternatives, the Fire Department *will* review project plans at the time of permitting. *The San Francisco Fire Department will require "a risk analysis to accurately determine the number of personnel necessary to maintain an acceptable level of service" (written communication, Aaron Stevenson, San Francisco Fire Department, May 29, 2001).*" To reduce the potential for impacts to occur under either the West Ramp or Loop Ramp Alternative, development and implementation of a life safety plan *will* be required. A life safety plan *will* include provision of on-site measures such as a fire command post at the Terminal, the Fire Department's 800-megahertz radio system and all necessary fire suppression equipment.

[3] Lieutenant Albert Pardina, Planning Division, SFPD, letter to Joan Kugler, January 10, 2003.

#### 5.4.2.3 Solid Waste Management

The West Ramp Alternative would provide for a greater intensity and mix of land uses, and thus would be expected to generate more solid waste than the Loop Ramp Alternative, which would entail about 110,000 square feet less space. Under either of the two alternatives, however, the generation of solid waste would be small when compared to the waste stream generated citywide (1.39 million tons). Impacts associated with the demolition of the existing Terminal would include a short-term increase in the amount of solid waste and debris disposed of which, according to sources at the Solid Waste Management Program, could be adequately accommodated by existing landfills.

Although an increase in solid waste generation and disposal would occur due to implementation of either the West Ramp or Loop Ramp Alternative, new or expanded facilities would not be required to accommodate the demand for Solid Waste Management Services, and therefore no mitigation measures are required. The following measures are recommended to achieve the 50 percent reduction goal specified in the California Integrated Solid Waste Management Act of 1989 (AB 939). In addition, compliance with all City and County ordinances regarding the minimization of waste though recycling would be expected to occur.

Short-term measures include utilizing recycled construction materials where feasible, encouraging recycling of construction and demolition materials, and including built-in compartmentalized recyclable material collection bins into the proposed developments.

Long-term measures include creating and implementing a long-term waste management plan for comprehensive recycling of materials. Such a plan would be developed in coordination with existing recycling programs in the area, and should target materials generated by office, residential and retail land uses such as paper, glass, aluminum beverage containers, and plastic. In addition, proposed development should have a designated space for the collection and storage of recyclable materials.

### 5.4.3 Caltrain Downtown Extension

#### 5.4.3.1 Public and Community Facilities

None of the public and community facilities described in Section 4.3 would be displaced, relocated, or otherwise affected by construction of the Caltrain Downtown Extension Alternatives.

#### 5.4.3.2 Safety and Emergency Services

**Police.** Implementation of either of the Caltrain Downtown Extension alternatives would not result in impacts to police protection services. As both alternatives would be located

underground, construction and use of the alignments would not be expected to require additional police staff or new or expanded police facilities. Caltrain security officers would continue to patrol the Caltrain vehicles en route towards the Transbay Terminal. Therefore, no mitigation measures are proposed.

**Fire and Emergency Medical Services.** Implementation of either of the proposed alternatives would be expected to increase the demand for fire prevention and suppression and emergency medical services during the construction and occupancy of the underground tunnel. To ensure that adequate life safety measures and emergency access would be incorporated into the design and construction of the design alternatives, the Fire Department *will* review project plans at the time of permitting. To reduce the potential for impacts to occur under either of the design alternatives, development and implementation of a life safety plan *will* be required. A life safety plan *will* include provision of on-site measures such as a fire command post near the tunnel operations, the Fire Department 800-megahertz radio system and all necessary fire suppression equipment located on the premises, if applicable, as well as adequate access to the underground tunnel.

#### 5.4.3.3 Solid Waste Management

Impacts associated with implementation of either of the proposed underground Caltrain Downtown Extension alternatives would be limited to short-term construction impacts associated with tunnel-bore operations. Construction impacts associated with the Caltrain Downtown Extension are addressed in greater detail in Section 5.21. The City's Solid Waste Management Program previously determined that the amount of construction debris generated and disposed of could be adequately accommodated by existing landfills.

### 5.4.4 Transbay Redevelopment Area

*The proposed project's redevelopment component would occur over time (through the year 2020). Generally, increases in population result in incremental increases in the demand for public services, in this case specifically for police and fire services. In written communication provided by both the police and fire departments, these providers plan to maintain the necessary staffing levels and equipment to meet the level and scope of service needs of the citizens of San Francisco, and to address the future growth resulting from the project.*

#### 5.4.4.1 Public and Community Facilities

None of the public and community facilities described in Section 4.3 would be displaced, relocated, or otherwise affected by construction of the Redevelopment Alternatives.

### 5.4.4.2 Safety and Emergency Services

**Police.** On the basis of the current ratio of police staffing to the population, the Police Department would require an estimated additional 85 to 115 staff under the Reduced Scope Alternative and Full-Build Alternative, respectively[4]. It is anticipated that an increase in demand such as this could be met by reorganizing existing staff (i.e., adjusting schedules, re-deploying officers), instead of hiring new staff. There are currently no plans for additional police facilities to serve this area.

*The San Francisco Police Department divides the City into different geographic areas, known as patrol sectors. In the South of Market area, there are currently five patrol sectors. The Transbay Terminal Area is within the southern patrol sector and serviced by the Southern Station. The southern patrol sector extends from Market Street on the north, Bryant Street on the south, The Embarcadero on the east, and Third Street on the west. If additional police presence in the southern patrol sector would be required, the police department could reorganize staff allocated to specific patrol sectors or could reconfigure the geographic area of a specific patrol sector by reducing the geographic area of the southern patrol sector and increasing another patrol sector where service demands are less (personal communication, Lt. Al Pardini, San Francisco Police Planning Division, July 2, 2003).*

Implementation of either development alternative would not be expected to require new or expanded facilities, and therefore no mitigation measures are required. To ensure adequate security measures are incorporated into the design of all new development, creation and implementation of a security plan, which would include measures that provide for state-of-the-art security and communications capabilities in each of the new facilities, is recommended.

**Fire and Emergency Medical Services.** The Fire Department anticipates that implementation of either the Full-Build Alternative or Reduced Scope Alternative could impact the Department's level of service in the study area. Demand may be great enough to require additional fire suppression personnel to maintain an adequate level of service. It is anticipated, however, that an increase in demand could be met through the reorganization of existing staff instead of hiring new staff. Furthermore, a proposal to build a new fire station in the nearby Mission Bay area could potentially offset any adverse impact to the Department's level of service in the area.

*According to the San Francisco Fire Department (SFFD), response times for Station 1 and Station 2 are approximately three to five minutes, and development of the proposed project is not expected to adversely affect existing response times (personal communication, Battalion Chief Paul Chin, June 27, 2003).*

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[4] Projections based on Port of San Francisco Waterfront Land Use Plan (San Francisco Planning Department, 1997). It is likely that these figures are over estimated due to the fact that they were calculated based on a standard ratio of officers per capita, and do not reflect the most realistic estimates of how the need for additional staff changes as population of a neighborhood changes. Police Department staff were not able to provide more accurate figures.

As part of the building permit process required for all new construction or building renovation, the building owner/developer must show evidence of the proposed work meeting current building and safety standards. In the case of renovations, additions such as new sprinkler systems, fire alarms or new exits are likely, thus improving a structure's overall fire protection. For new construction, some projects would require the demolition of older buildings, thus reducing the existing fire hazards they may pose. Therefore, any level of future development in the Redevelopment Area would result in improved fire protection due to an increase in the number of structures that adhere to the most recent fire and safety code requirements.

Future development is assumed to result in a decrease in the amount of industrial square footage in the area. As the amount of industrial space diminishes and new construction activity results in the cleaning up of contaminated sites, the potential for fires or other incidents related to hazardous materials would be reduced. In addition, existing hazardous materials programs would likely be able to expand and receive additional financial support as the number of fee-paying businesses increases.

Additional development under either of the redevelopment area alternatives could adversely affect emergency medical resources, especially during daytime hours. Demand may be great enough to require larger staffing, but in most cases new staffing could be supported by new user fees, provided fee allocations allow for it.

#### 5.4.4.3 Solid Waste Management

The City's Solid Waste Program calculates citywide solid waste generation by adjusting yearly taxable sales, the California Consumer Price Index (CPI), population growth, and employment. The annual diversion rate is then calculated by using the known disposal tonnage and the adjusted waste generation figure. The current diversion rate is 42 percent, which could likely increase to more than 50 percent by the horizon year 2020. Accordingly, solid waste generation tonnage could vary from approximately 1.39 million tons towards more than 1.5 million tons by 2020.

Based on development projections for recent studies in the Transbay Area, it is estimated that the Redevelopment Area would generate at least 15,000 tons and dispose of at least 12,000 tons per year of combined residential and commercial waste under the Full Build Alternative.[5] Given that the total citywide waste stream is approximately 1.39 million tons per year, the occupancy waste from development under either of the alternatives would constitute less than 0.9 percent of the entire solid waste stream.

[5] This figure was estimated using a 42 percent diversion rate and the following waste generation assumptions used by the City's Solid Waste Program: 3 lbs. per residential square foot during construction, 1.02 tons per household during occupancy, 11.5 lbs. per commercial square foot during construction, 2.6 lbs. per square foot of office space per year during occupancy and 3.1 lbs. per square foot of commercial space per year during occupancy.

As implementation of either the Full-Build or Reduced Scope alternatives would not result in an impact to Solid Waste Management Services, no mitigation measures are required. The measures outlined previously for the Transbay Terminal alternatives could potentially reduce the short-term and long-term impacts to Solid Waste Management, including the City's ability to achieve the state mandated 50 percent reduction goal (AB 939). In addition, compliance with current City and County ordinances regarding the minimization of waste through recycling would be required.

## 5.5 PARKLANDS, SCHOOLS, AND RELIGIOUS INSTITUTIONS

The No-Project Alternative would have no effect on parks, schools, or religions institutions. The remainder of this section therefore focuses on the Terminal/Extension/Redevelopment project effects.

With the exception of the set-back and porte-cochere (semi-circular drive) immediately in front of the existing Transbay Terminal, none of the open spaces, parks, recreational facilities, universities, or churches described in Section 4.4 would be displaced or affected as part of any of the Transbay Terminal, Downtown Extension or Redevelopment alternatives, except to the extent that transit access and traffic patterns would change.

### 5.5.1 Parklands

Both the Transbay Terminal alternatives would displace the set-back and porte-cochere located in front of the existing Transbay Terminal. The existing area is almost entirely paved, and would not be considered a "park" in most senses of the word, although the 1994 Draft Downtown Streetscape Plan developed by the San Francisco Planning Department calls for "retaining the area in front of the Terminal or other suitable areas for much needed open space," and "retaining . . . a garden walk pedestrian connection and open space," on the former freeway parcels south of the Terminal. The current concept for the new Transbay Terminal includes an open plaza for public use and a grand staircase as the front entrance to the new terminal.

Both Redevelopment Alternatives would introduce new public open space into the Transbay Redevelopment Area, an area currently lacking public open space and parks. The current open space concept for the area includes four primary public open spaces, with two open spaces forming Fremont Square, a primarily hardscaped plaza that would be adjacent to the new Terminal and would replace the existing open space and two new "green" open spaces. Natoma Green would be located between Minna and Natoma Streets and would serve as a mixed-use educational and cultural center, and Essex Green would be located between Tehama and Clementina Streets. In addition, smaller open spaces such as pocket parks, sitting areas, and playgrounds are proposed for the area. The addition of new public open space to the Transbay Redevelopment Area would represent an improvement over current conditions.

### 5.5.2 Schools

No schools would be displaced, relocated, or disrupted by the project. Private schools and colleges located within the vicinity of the Terminal, such as Golden Gate University, would likely benefit from the improved transit operations and the creation of new transit-oriented development (retail, cultural, commercial uses). Moreover, the new, aesthetic design of the Terminal would create a distinct point of interest in the Transbay Area, which could in turn attract new patrons. Short-term construction effects such as noise, redistribution of traffic, and dust would be anticipated to occur; these are discussed in Section 5.21.7, Construction Impacts on Parks, Schools, and Religious Institutions.

Increased public school enrollment at the K-12 level generated by proposed residential development in the Transbay Redevelopment Area would increase demand for school facilities. Based on the student generation rate of 0.203 students per new housing units used by the San Francisco Unified School District (SFUSD) for planning purposes, the number of students that could potentially be added to the Transbay Redevelopment Area would range from about 685 students under the Reduced Scope Alternative (3,373 housing units) to about 737 students under the Full Build Alternative (3,630 housing units).

Funding for school construction is generated by fees on new development, at levels capped by the State legislature. The current State legislature establishes a maximum fee for residential development at $1.93 per square foot, and $0.31 per square foot of commercial development. The San Francisco Board of Education has not adjusted the fees in the San Francisco Unified School District (SFUSD) since 1994; current SFUSD fees are $1.72 per square foot of residential development, $0.24 per square foot of office, and $0.13 per square foot of retail. Fees of $0.08, $0.09, $0.15, and $0.22 per square foot of lodging, warehouse, heavy industrial, and light industrial development, respectively, are also charged by the SFUSD. At the current rate fees, development proposed for the Transbay Redevelopment Area under the Full Build Alternative would generate about $10 million in fees, and about $7 million in fees would be generated under the Reduced Scope Alternative.

School development fees are considered under Senate Bill 50 (SB50) to mitigate any potential effect associated with the implementation of proposed residential development under either development alternative.

### 5.5.3 Religious Institutions

Due to their distance from the proposed improvements, none of the religious institutions identified in Section 4.4 would experience long-term impacts of the project components, although there would be limited short-term construction effects such as noise, redistribution of traffic, and dust. These impacts are addressed in Section 5.21.7.

As there would be no long-term adverse effects to parklands, schools, and churches, no mitigation is proposed.

## 5.6 FISCAL AND ECONOMIC IMPACTS

### 5.6.1 No-Project Alternative

The No-Project Alternative is the reference point for estimating the fiscal and economic impacts of the proposed project alternatives and therefore, by definition, would have no impacts. The rest of this section therefore focuses on the impacts of the Terminal/Extension/Redevelopment project.

### 5.6.2 Transbay Terminal/Caltrain Extension/Redevelopment

Because the Transbay Terminal, Caltrain Downtown Extension, and Redevelopment components are very closely related from the point of view of fiscal and economic impacts, these effects are discussed together in this section.

To construct the Caltrain Downtown Extension from Fourth and Townsend Streets to the site of the Transbay Terminal, land and buildings will need to be acquired, and permanent underground easements will need to be secured. Due to Caltrain design standards, local geology, and the resultant depth of the Caltrain alignment, the construction of either alternative, as presently envisioned, may involve the acquisition and demolition of buildings under which the alignment would pass, depending on the construction technique selected (cut-and-cover versus tunneling). After the underground extension is constructed, these properties would be available for resale as vacant sites ready for new construction. The properties that would be affected by the extension are detailed in Section 5.2.

Properties identified in Section 5.2 are in private ownership; publicly-owned properties are excluded from this fiscal analysis. These publicly-owned properties would be transferred to the Transbay Joint Powers Authority (TJPA – see Section 1.3, Project Sponsors) and the Redevelopment Agency from the State of California (see Section 6).

#### 5.6.2.1 Net Order-of-Magnitude Land Building and Easement Cost

This analysis estimates the order of magnitude cost to acquire the privately-owned land, buildings, and easements needed to construct the Caltrain Downtown Extension Alternative. This order of magnitude cost estimate also includes the following items:

- Estimated premium associated with eminent domain proceedings, such as legal fees, appraisal costs, and other consulting and administrative costs;
- Estimated cost to relocate commercial and residential tenants and owner-occupants; and
- Estimated building demolition costs.

The cost estimate does not include payments associated with business interruption, loss of goodwill, and "nuisance" costs associated with the construction of the extension, including loss of property access. Costs would be partially offset by the estimated proceeds from resale of the properties as vacant sites become available for new construction.

**Acquisition Costs.** Compensation to owners of the acquisition parcels would be based on accepted appraisal techniques, specifically comparison to sales of other buildings in the broader South of Market neighborhood. Because the individual properties exhibit a wide range of building sizes, conditions, tenancies, etc., a broad price range was used to prepare the order of magnitude cost estimate. Individual properties have not been appraised at this stage; however, if a property recently transferred ownership, the actual transaction was factored into the analysis.

Using such sources as First American Real Estate Solutions, Comps Inc., and Marshall Valuation Service, estimated cost ranges were determined for each land use type to be acquired under each alternative and option. Based on these estimates, Tables 5.6-1, 5.6-2 and 5.6-3 provide a summary of the estimated acquisition costs for the Transbay Terminal and the two Caltrain Downtown Extension Alternatives for both the Cut-and-Cover and Tunneling Options.

Estimates include an assumed premium associated with possible eminent domain proceedings and relocation costs, which is based on information provided by the San Francisco Redevelopment Agency and professional experience with other redevelopment and eminent domain projects.

**Table 5.6-1: Summary of Acquisition Cost Estimates**
**Transbay Terminal & Redevelopment Properties**

| | Low | High |
|---|---|---|
| Estimated Acquisition Cost [1] | *$34,000,000* | *$46,400,000* |
| Relocation Cost | $300,000 | $300,000 |
| Demolition Cost | $300,000 | $300,000 |
| **Total Net Acquisition Costs** | ***$34,600,000*** | ***$47,000,000*** |

Notes:
[1] Includes premium for possible condemnation proceedings.
Sources: Sedway Group; City of San Francisco; First American Real Estate Solutions; Comps Inc.; Marshall Valuation Service, August 2001.

**Table 5.6-2: Summary of Acquisition Cost Estimates Second-to-Main Alternative**

| | Low | High |
|---|---|---|
| **Cut-and-Cover Option** | | |
| Estimated Acquisition Cost [1] | *$124,400,000* | *$202,400,000* |
| Easements | *1.200,000* | *1,200,000* |
| Relocation Cost | $4,100,000 | $4,100,000 |
| Demolition Cost | $3,200,000 | $3,200,000 |
| Resale Proceeds | *($27,200,000)* | *($88,100,000)* |
| **Total Net Acquisition Costs** | ***$105,700,000*** | ***$122,800,000*** |
| **Tunneling Option** | | |
| Estimated Acquisition Cost | | |
| Fee [1] | *$46,000,000* | *$69,800,000* |
| Easements | *$2,200,000* | *$2,200,000* |
| Relocation Cost | $2,400,000 | $2,400,000 |
| Demolition Cost | $1,100,000 | $1,100,000 |
| Resale Proceeds | *($7,600,000)* | *($24,900,000)* |
| **Total Net Acquisition Costs** | ***$44,100,000*** | ***$50,600,000*** |

**Note:** [1] Includes premium for condemnation.
**Sources:** City of San Francisco; Sedway Group; First American Real Estate Solutions; Comps Inc.; Marshall Valuation Service, August 2001.

**Table 5.6-3: Summary of Acquisition Cost Estimates Second-to-Mission Alternative**

| | Low | High |
|---|---|---|
| **Cut-and-Cover Option** | | |
| Estimated Acquisition Cost [1] | $188,100,000 | $277,800,000 |
| Relocation Cost | $4,500,000 | $4,500,000 |
| Demolition Cost | $3,800,000 | $3,800,000 |
| Resale Proceeds | ($66,000,000) | ($148,500,000) |
| **Total Net Acquisition Costs** | **$130,400,000** | **$137,600,000** |
| **Tunneling Option** | | |
| Estimated Acquisition Cost | | |
| Fee [1] | $109,800,000 | $145,300,000 |
| Easements | $1,000,000 | $1,000,000 |
| Relocation Cost | $2,800,000 | $2,800,000 |
| Demolition Cost | $1,800,000 | $1,800,000 |
| Resale Proceeds | ($46,400,000) | ($85,200,000) |
| **Total Net Acquisition Costs** | **$69,000,000** | **$65,700,000** |

**Notes:** [1] Includes premium for condemnation.
**Sources:** City of San Francisco; Sedway Group; First American Real Estate Solutions; Comps Inc.; Marshall Valuation Service, 2001.

Relocation costs are estimated at $35,000 per unit for residential units, $40,000 per business for small- and medium-sized businesses, and $120,000 for large businesses. The relocation costs used here are estimates to be used for planning and budgeting purposes. Actual relocation payments will be determined at the time of project implementation using state and federal guidelines.

Demolition costs are based upon cost estimates provided by Marshall Valuation Service. Depending upon the construction type of the building and other individual factors, demolition costs range from $3.60 to $8.10 per square foot of building area. An average of $5.85 per square foot of building was used.

After construction of the Caltrain Extension, the properties would be available for resale as developable vacant sites. The estimated resale proceeds would partially offset the estimated acquisition costs, resulting in a net acquisition cost estimate. Resale proceeds estimates are based upon land prices per square foot of land area. A broad range is used to reflect the wide variety of locations of the individual properties and their respective unknown redevelopment potentials. For commercial sites, the estimated range is $100 to $300 per square foot of land area, while for residential properties, the range is from $200 to $760 per square foot of land area.[6] As shown in the tables, estimated resale proceeds range from $34 to $113 million for the Second-to-Main Alternative and from $69 to $153 for the Second-to-Mission Alternative.

### 5.6.2.2 Total Net Acquisition Cost Estimate

Based on each of the acquisition components described above, the net acquisition cost estimate for the Transbay Terminal and the Caltrain Downtown Extension (in 2001 constant dollars), including land, buildings, and easement, is as follows:

Estimated net acquisition costs for properties required for:

- Transbay Terminal - *$34.6 to $47.0 million*
- Second to Main Caltrain Downtown Extension
  - Cut-and-Cover Option – *$105.7 to $122,8 million*
  - Tunneling Option – *$44.1 to $50.6 million*
- Second to Mission Caltrain Downtown Extension Alternative
  - Cut-and-Cover Option – *$130.4 to $137.6 million*
  - Tunneling Option - *$65.7 to $69.0 million.*

These cost ranges include estimated premiums associated with eminent domain proceedings, relocation costs, and demolition costs. Business interruption, loss of goodwill, and "nuisance" costs are not included.

[6] The two properties on Mission Street for the Second-to-Mission Alternative are estimated at $700 to $790 per square foot of land area, due to a recent partial transfer of these properties.

### 5.6.2.3 Fiscal Implications of Land Acquisition for Caltrain Downtown Extension

The acquisition of real estate parcels for construction of the Caltrain Downtown Extension would result in fiscal impacts to the City and County of San Francisco. These effects are anticipated to be short-term, lasting only for the duration of the construction period and any subsequent period required for property resale. This analysis assumes that all of the acquired properties are ultimately resold to private parties. If the properties remain in public ownership, the implications would be longer-term.

The properties identified for acquisition currently generate revenues to the City and County of San Francisco through taxation, both directly and indirectly. These revenues include property taxes, payroll taxes, retail sales taxes, parking taxes, and other less significant taxes, such as utility taxes. Once the properties are purchased by a public entity for construction of the Transbay Terminal and Caltrain Downtown Extension, they would no longer generate property taxes to the City and County of San Francisco, because public entities' owners are exempt from such taxation. In addition, the ultimate demolition of existing development will result in the loss of occupancy-related taxes, such as payroll taxes paid by existing businesses, retail sales taxes generated by existing restaurants and retailers, retail sales taxes generated by subject property residents, and parking taxes paid by existing parking operators.

**Property Tax.** The properties to be acquired for the Caltrain Downtown Extension for the Cut-and-Cover Option have a year 2000 assessed valuation of $76.0 million for the Second-to-Main Alternative and $104.0 million for the Second-to-Mission Alternative.[7] Pursuant to the annual allowable property value increase of two percent under Proposition 13, and a recent area real estate transaction involving 301-315 Mission Street and 101-129 Fremont Street[8] (which properties lie within the alignment for the Second-to-Mission Alternative), these assessed valuations for the year 2001 are assumed to increase to approximately $77.6 million for the Second-to-Main Alternative and $127.6 million for the Second-to-Mission Alternative.[9] Given the City and County of San Francisco's current property tax rate of 1.136 percent, these properties generate annual property tax revenues to various City and County funds of $881,109 for the Second-to-Main Alternative and $1,449,109 for the Second-to-Mission Alternative. For the Tunneling Option, fewer parcels will need to be acquired. Therefore, the property tax revenues associated with these properties are lower, estimated at $517,379 for the Second-to-Main Alternative and $841,426 for the Second-to-Mission Alternative. Regardless of option, the property tax revenues associated with the properties requiring acquisition for the Transbay Terminal total an additional $97,536.

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[7] Assessed valuation as reported by First American Real Estate Solutions, August 2001.

[8] Eighty percent interests in these properties were recently sold for $40 million, implying a $50 million total valuation. It is assumed the County Tax Assessor will include this total valuation in the 2001 property tax rolls.

[9] The full figures are $77,562,377 for Second-to-Main and $127,562,377 for Second-to-Mission.

These revenues would be lost to the City and County of San Francisco for the time period the properties are under public ownership. However, many of the properties could be resold following construction of the Caltrain Downtown Extension. If the properties were resold to private parties following construction of the Downtown Extension, property tax revenues would again accrue to the City and County of San Francisco (and the San Francisco Redevelopment Agency pending formulation of a redevelopment project area). To the extent subsequent development occurs, higher property tax revenues might ultimately accrue to the City and County of San Francisco due to higher assessed values associated with new, more intense development with higher values than the present uses. Thus in the long run, the short-term property tax losses may be recouped and even exceeded following new development reflecting the highest and best use of each property.

**Payroll Tax.** Payroll taxes, assessed at a rate of 1.5 percent of gross payroll, are a significant revenue source to the City and County of San Francisco. There are up to 67 operating businesses located in the properties identified for acquisition for the Downtown Extension and the Transbay Terminal, depending upon alternative and option. An estimate of the number of employees associated with these businesses and their average annual payroll provides a basis for formulating a general estimate of annual payroll and associated payroll taxes. If any of these businesses were to close or relocate out of San Francisco, their payroll taxes would be lost to San Francisco. Although area-related payroll taxes would resume following redevelopment of the properties, any taxes lost during the construction and property resale period would not be recouped by San Francisco, unless these businesses were successfully relocated within San Francisco prior to or during construction. If these businesses were successfully relocated within San Francisco prior to or during construction, their payroll taxes would be preserved, both during and after construction.

For each alternative and option, the total square feet by land use and a square-foot-per-employee estimate provides a basis for estimating total affected employment. This, coupled with an annual per capita payroll estimate, provides an estimate of the maximum payroll taxes that would be foregone as a result of business closures and relocations out of San Francisco with the Caltrain Downtown Extension. The calculated results per alternative are presented in Table 5.6-4, which estimates that for the Cut-and Cover Option, 1,089 jobs are associated with the Second-to-Main Alternative properties and 1,219 jobs are associated with the Second-to-Mission Alternative properties. For the Tunneling Option the figures are lower, totaling 424 employees for the Second-to-Main Alternative and 762 employees for the Second-to-Mission Alternative. Assuming an annual average payroll of $52,000 per employee,[10] estimated annual payroll taxes for the Cut-and-Cover Option are $849,420 for the Second-to-Main Alternative and $1,113,060 for the Second-to-Mission Alternative. For the Tunneling Option, these figures are $330,720 for the Second-to-Main Alternative and $594,360 for the Second-to-Mission Alternative. While not included in Table 5.6-4, the Transbay Terminal properties have an additional estimated 200 office employees, with an associated payroll tax estimate of $156,000.

[10] Derived from County Business Patterns data for all San Francisco employees.

These are revenues that would be retained in both the short-term and long-term by the City and County of San Francisco if the affected businesses were to be successfully relocated within San Francisco. They would be lost only if the businesses were to close or relocate out of San Francisco following demolition of their existing space.

**Retail Sales Tax.** Retail sales taxes accrue to the City and County of San Francisco at a rate of 1.25 percent of total taxable sales. Retail sales taxes would accrue from the retail businesses and restaurants within the affected properties as well as from citywide spending by residents who live in the affected properties. As presented in Table 5.6-4, there are 19,680 square feet of retail and restaurant space included in the properties that would need to be acquired for both the Cut-and Cover and Tunneling Options. There are no additional retail properties associated with the Transbay Terminal. At a conservative $200 taxable sales per square foot annually, these operations generate an estimated $49,200 in retail sales taxes to the City and County of San Francisco annually. These revenues would be lost only if the affected businesses were to close or relocate outside of San Francisco. As with the payroll taxes, these retail sales taxes would be preserved if these operations were to be successfully relocated within San Francisco prior to or during construction.

For both Alternatives under the Cut-and-Cover Option, construction of the Caltrain Downtown Extension will require the acquisition and demolition of 60 residential units, including 14 live/work units. This translates into the relocation of an estimated 120 persons, assuming an average of two residents per unit. Under the Tunneling Option, only 23 residential units will be acquired and demolished. If each resident spends $7,200[11] in taxable retail sales in San Francisco, the total annual sales tax contribution to the City and County of San Francisco would amount to a rather low $10,800 for the Cut-and-Cover Option and $4,140 for the Tunneling Option. Thus retail sales taxes at risk of loss would total only $60,000 per year for the Cut-and-Cover Option and $53,340 for the Tunneling Option. These taxes would be lost to the city only if all of the affected residents were to do all of their spending elsewhere. There are no residential units associated with the Transbay Terminal; hence no additional retail sales tax impacts.

**Other Tax.** Other taxes generated by real estate may also be interrupted or cease subsequent to acquisition of the properties for construction of the Caltrain Downtown Extension. These include utility user taxes, franchise fees, and, for the three existing parking facilities (with less than an estimated 100 spaces), parking taxes. These tax revenues are likely to be very insubstantial relative to the preceding taxes, especially property and payroll taxes, and were not quantified.

[11] Assumes $9,000 per capita in retail sales expenditures, with 80 percent captured by San Francisco retailers.

**Table 5.6-4: Estimated 2001 Payroll Tax Revenue Generated by Business Displaced by Construction of the Caltrain Downtown Extension Alternatives**

| | Cut-and-Cover Option | | Tunneling Option | |
|---|---|---|---|---|
| | Second-to-Main | Second-to-Mission | Second-to-Main | Second-to-Mission |
| Industrial Space | | | | |
| Square Feet | 126,880 | 126,880 | 2,600 | 2,600 |
| Square Feet Per Employee | 750 | 750 | 750 | 750 |
| Total Employment | 169 | 169 | 3 | 3 |
| Office Space | | | | |
| Square Feet | 286,358 | 396,315 | 124,157 | 234,114 |
| Square Feet Per Employee | 325 | 325 | 325 | 325 |
| Total Employment | 881 | 1,219 | 382 | 720 |
| Retail/Restaurant | | | | |
| Square Feet | 19,680 | 19,680 | 19,680 | 19,680 |
| Square Feet Per Employee | 500 | 500 | 500 | 500 |
| Total Employment | 39 | 39 | 39 | 39 |
| Total Employment | 1,089 | 1,427 | 424 | 762 |
| Average Annual Payroll (1) | $52,000 | $52,000 | $52,000 | $52,000 |
| Payroll Tax Rate (2) | 1.5% | 1.5% | 1.5% | 1.5% |
| Annual Payroll Tax Revenue | $849,420 | $1,113,060 | $330,720 | $594,360 |

Notes:

(1) Annual payroll reflects countywide average annual payroll for all San Francisco workers in 1999 inflated three percent annually to 2001 dollars.

(2) Current payroll tax rate in San Francisco County

Sources: First American Real Estate Solutions; County Business Patterns; U.S. Bureau of the Census, 1999, San Francisco, CA; Office of the Treasurer and Tax Collector, City of San Francisco; and Sedway Group.

**Summary Tax Implications.** Table 5.6-5 summarizes the major annual tax revenues attributable to the properties that would be involved in the acquisition process for the Transbay Terminal and the Caltrain Downtown Extension. For the Cut-and-Cover Option, these revenues total $1.8 million for the Second-to-Main Alternative and $2.6 million for the Second-to-Mission Alternative. For the Tunneling Option, these revenues are much lower at approximately $0.9 million for the Second-to-Main Alternative and $1.5 million for the Second-to-Mission Alternative. The net increment attributable to the Transbay Terminal is estimated at approximately $250,000.

**Table 5.6-5: Annual 2001 San Francisco Taxes at Risk of Loss Due to Property Acquisitions**

| Type of Tax | Cut-and-Cover Option | | Tunneling Option | | Transbay Terminal |
|---|---|---|---|---|---|
| | Second-to-Main | Second-to-Mission | Second-to-Main | Second-to-Mission | |
| Property | $881,109 | $1,449,109 | $517,379 | $841,426 | $97,536 |
| Payroll | $849,420 | $1,113,060 | $330,720 | $594,360 | $156,000 |
| Retail Sales | $60,000 | $60,000 | $53,340 | $53,340 | $0 |
| **Total** | **$1,790,529** | **$2,622,169** | **$901,439** | **$1,489,126** | **$253,536** |

At worst, all of these revenues would be lost to the City and County of San Francisco following acquisition of the properties to construct the Downtown Extension. At least, property taxes – which comprise the greatest portion of the total revenues – would be lost during the construction period due to public ownership of the property until the extension was constructed. The other revenue sources, however, might or might not be interrupted, depending upon whether or not the affected businesses and residents were successfully relocated within San Francisco prior to or during construction. To the extent they were successfully relocated, there would be no disruption in these tax revenues. Alternatively, if all of the businesses were not successfully relocated, some portion of the tax revenues would be lost, until such time as the properties were resold and redeveloped.

Given the size and nature of existing development, it is likely that subsequent redevelopment would be more intense and would more accurately reflect the highest and best use of the properties. Thus, in the long run, the short-term property and other tax losses may be recouped and even exceeded.

## 5.7 AIR QUALITY

This section considers long-term impacts and benefits of the three project components with regard to regional air quality. It also considers the project's conformity with the applicable State Implementation Plan (SIP), as required by the Clean Air Act amendments of 1993. Impacts are assessed by comparing conditions under the No-Project and project alternatives, and by comparing projected concentrations of pollutants to the ambient air quality standards (AAQS).

### 5.7.1 Regional Air Quality

Provision of a multi-modal transit facility and extension of Caltrain to Downtown San Francisco is projected to reduce the number of miles traveled by autos in the region, which in turn would result in an overall reduction of air emissions. This section estimates the direct auto travel and

air emissions reduction anticipated as part of the Caltrain Extension as calculated by the transportation modeling and ridership projections. As the Transbay Terminal is a replacement of an existing facility, anticipated auto travel reductions were not included in the modeling projections. To the extent that a new Terminal would attract new bus riders, auto travel and air emissions may be further reduced beyond the estimates provided.

The proposed redevelopment would generate additional trips, and the air emissions implications of these trips at local intersections are evaluated in Section 5.7.2. However, by locating large-scale, high density residential, commercial and institutional development near the site of a transit hub, the project can be expected to divert to public transit many trips that would otherwise be made by the private automobile. This transit-oriented development is expected to improve transit's ability to attract a larger mode share of persons commuting to jobs in the region, in that the Terminal and Caltrain Extension would provide an attractive transportation option to the automobile for new residents and workers in the area.

**Auto travel and air emission reductions from the Caltrain Downtown Extension.** Future emissions from automobile traffic were projected to evaluate the effect of the Caltrain Downtown Extension, based on projected ridership, which is expected to be identical for both the Second-to-Mission and the Second-to-Main alternatives. The effect of the Caltrain Downtown Extension on regional emissions of pollutants was calculated based on the number of vehicle miles diverted from private automobiles and public buses to the electric-powered trains operating on the Downtown Extension. The proposed project is expected to produce a decrease in vehicle miles of travel (VMT), and would therefore result in a reduction of emissions associated with automobiles. Specifically, the total daily VMT in the region (under either the Second-to-Main or Second-to-Mission alternatives) would be about 260,000 less than under the No-Project Alternative, including a 3,668 reduction in bus VMT. This decrease would result in incremental regional reductions in the projected daily local emissions burden (measured in pounds per day or tons per year) of some pollutants, as shown in Table 5.7-1.

**Table 5.7-1: Reductions in Air Pollution Emissions Resulting from the Caltrain Downtown Extension [1]**

| Pollutant | Reduction in Emissions (pounds per day) | Reduction in Emissions (tons per year) |
|---|---|---|
| Reactive organic gases (ROG) | 329 | *52* |
| Carbon monoxide (CO) | 5,211 | *820* |
| Oxides of nitrogen (Nox) | 899 | *142* |
| Particulate matter ($PM_{10}$) | 30 | *5* |
| Oxides of sulphur (Sox) | 18 | *3* |

[1] The results are identical for either Caltrain Downtown Extension alternative (Second-to-Main or Second-to-Mission).

**Source:** Terry A. Hayes Associates, September 2001; Parsons, September 2001

### 5.7.2 Microscale Air Quality

Existing local carbon monoxide (CO) conditions were assessed using the carbon monoxide dispersion computer model CAL3QHC. The model uses state and federally approved emissions factors,[12] meteorological data, traffic volume, speed, and vehicle mix inputs. The results of the model are then added to the background or "ambient" conditions to provide an estimate of local conditions.

Within the urban setting, vehicle exhaust is the main source of CO. Therefore, the highest concentrations of CO are found near busy intersections. CO is a localized gas, and its concentrations decrease substantially as distance from the source (intersection) increases. To provide a worst-case simulation of CO concentrations within the area that may be affected by the proposed project, CO concentrations at sidewalks adjacent to eight area intersections were modeled. The study intersections (listed in Table 5.7-2 along with existing CO concentrations) were selected based on their potential to experience the greatest impacts with regard to volume, capacity, and level of service, and are intended to represent the "worst case" for impacts among the 27 intersections that were evaluated in the project traffic report.[13]

**Table 5.7-2: Existing (2001) Weekday P.M. Peak Hour Carbon Monoxide Concentrations at Study Intersections (ppm)**

| Study Intersection | Highest Concentration at Intersection (ppm) | | | |
|---|---|---|---|---|
| | 1-Hour Concentration | Standard Exceeded? (State-20.0 ppm Federal-35 ppm) | 8-Hour Concentration | Standard Exceeded? (State & Federal-9.0 ppm) |
| First/Market | 11.7 | No | 8.2 | No |
| First/Mission | 12.4 | No | 8.7 | No |
| First/Howard | 14.3 | No | 10.0 | Yes |
| Beale/Howard | 12.0 | No | 8.4 | No |
| Second/Folsom | 12.7 | No | 8.9 | No |
| Second/Harrison | 12.1 | No | 8.5 | No |
| Fremont/Harrison | 10.9 | No | 7.6 | No |
| Main/Harrison | 10.2 | No | 7.1 | No |

**Source:** California Air Resources Board and Terry A. Hayes Associates, LLC. September 2001.

[12] California Air Resources Board, MVEI7G Emissions Factors, Run, Date: 6/18/01.

[13] Wilbur Smith Associates, Transbay Terminal Area/Caltrain Extension Traffic Analysis, September 7, 2001.

### 5.7.2.1 Existing Carbon Monoxide at Local Intersections

For each of the eight intersections modeled, traffic-related CO contributions were added to the background conditions discussed above. Traffic CO contributions were estimated using the CAL3QHC dispersion model. As demonstrated in Table 5.7-2, none of the eight study intersections currently exceeds the state or federal one-hour CO concentration standard of 20.0 ppm. The intersection of First and Howard Streets, however, currently exceeds the state and federal eight-hour standard of 9.0 ppm.

### 5.7.2.2 Future Carbon Monoxide Concentrations at Study Intersections

The CAL3QHC micro-scale dispersion model was used to calculate CO concentrations for year 2020 No-Project Alternative and "project" conditions. The evaluation of project conditions assumed the Downtown Extension, with a "worst case"[14] development scenario (i.e., maximum development) that included the Full-Build Alternative and the Transbay Terminal West Loop Alternative.

Overall, CO concentrations are expected to be lower than existing conditions in the year 2020 due to stringent state and federal mandates for lowering vehicle emissions. Although traffic volumes would be higher in the future both with and without implementation of the proposed project, increases in traffic volumes are expected to be offset by increases in cleaner-running cars as a percentage of the entire vehicle fleet on the road.

Projected CO concentrations at the eight "worst case" intersections are shown in Table 5.7-3. As indicated, one-hour CO concentrations under project conditions would range from approximately 4.0 ppm to 5.7 ppm at these intersections. Project eight-hour CO concentrations are anticipated to range from approximately 2.8 ppm to 4.0 ppm. The state and federal one-hour standards would not be exceeded at any of the eight study intersections. Similarly, none of the eight intersections is anticipated to exceed the state or federal eight-hour standard. Incremental increases in CO concentrations at all intersections under both the one-hour and eight-hour scenario would be less than one part per million.

[14] Maximum development was considered "worst case" for this analysis, because it would generate incrementally more automobile trips than the Reduced Scope and Loop Ramp alternatives. Nevertheless, the number of automobile trips generated by any of the project alternatives is considered low. As stated in Section 5.19, the traffic analysis assumed a greater transit mode share than could be achieved in a location that does not have the transit access of the proposed Transbay Terminal Redevelopment Area.

**Table 5.7-3: Future (2020) Weekday P.M. Peak Hour Carbon Monoxide Concentrations at "Worst Case" Intersections**

| Intersection | 1-Hour Concentration (ppm) | | | | 8-HourConcentration (ppm) | | | |
|---|---|---|---|---|---|---|---|---|
| | No Project | With Project [1] | Change | Impact? | No Project | With Project [1] | Change | Impact? |
| First/Market | 4.6 | 4.7 | 0.1 | No | 3.2 | 3.3 | 0.1 | No |
| First/Mission | 4.8 | 5.0 | 0.2 | No | 3.4 | 3.5 | 0.1 | No |
| First/Howard | 5.4 | 5.7 | 0.3 | No | 3.8 | 4.0 | 0.2 | No |
| Beale/Howard | 4.6 | 5.0 | 0.4 | No | 3.2 | 3.5 | 0.3 | No |
| Second/Folsom | 4.8 | 5.1 | 0.3 | No | 3.4 | 3.6 | 0.2 | No |
| Second/Harrison | 4.5 | 4.6 | 0.1 | No | 3.2 | 3.2 | 0.0 | No |
| Fremont/Harrison | 4.1 | 4.1 | 0.0 | No | 2.9 | 2.9 | 0.0 | No |
| Main/Harrison | 3.9 | 4.0 | 0.1 | No | 2.7 | 2.8 | 0.1 | No |

[1] "Project" includes the Caltrain Downtown Extension, as well as the Redevelopment and Transbay Terminal alternatives with the greatest development impact (the Full-Build and West Loop Alternatives)

Source: Terry A. Hayes Associates, LLC. September 2001.

### *5.7.3 Supplemental Air Quality Impact Analysis of the Permanent Bus Storage Area*

*In response to public comments on the Draft EIS/EIR, a supplemental air quality assessment was completed for the proposed permanent mid-day bus storage facility under the West Approach to the Bay Bridge between Second and Fourth Streets. The supplemental assessment evaluated the effect of the proposed relocation of the Transbay Terminal bus layover and storage area from the immediate terminal area to a new location between Second and Fourth Street and north of Stillman Street underneath the aerial structure of I-80. The assessment identified the change in year 2020 concentrations of three criteria pollutants that would typically have a direct localized effect on adjacent sensitive land uses, i.e. carbon monoxide, nitrogen dioxide and $PM_{10}$. Sensitive locations within approximately 500 feet of the relocated bus storage/layover area were evaluated.*

*The assessment was based on year 2020 diesel bus emission factors as set forth by the California Air Resources Board (CARB). These emission factors reflect the projected diesel bus fleet mix for the year 2020 and were adjusted to include bus models from the year 2008 until 2020 only, which reflects the anticipated fleet mix for the proposed project. CARB considers clean diesel technology when calculating its emission factors but does not assume that all buses running in the year 2020 will be clean diesel.*

*The air quality analysis incorporated meteorological data taken from the Arkansas Street air monitoring station, which is approximately one mile south of the proposed bus storage facility. Local wind patterns, as measured from the station, were taken into account in order to estimate pollution concentrations, including those associated with diesel buses. The analysis took into account the cumulative effect of various pollutant sources on the area. Included in the analysis*

*is the ambient background concentration as measured by the nearest air monitoring station as well as pollutant concentrations generated by street traffic and freeway traffic.*

*The proposed storage area is currently used for vehicular parking, and an additional vehicular parking structure is proposed to replace the existing parking (or a fraction thereof) lost as a result of the proposed project. The amount of vehicular parking would remain the same or decrease under the proposed Project scenario, and emissions from street traffic, which reflect traffic generated by the current parking lots, were included in the overall pollution concentration levels projected for future conditions. Thus, impacts from the proposed replacement parking structure were considered in the air analysis, and concentration levels due to the proposed parking lot would remain equal to or below the amount generated from existing parking.*

*The assessment assumed that buses would be running at the storage site for a few minutes each day. Specifically, when estimating pollutant concentration, it was assumed that the buses would be idling for three minutes and that they would be moving at 15 miles per hour on the dedicated ramps – a conservative estimate. It would take between six and 11 minutes for the buses to travel to the terminal from the proposed storage facility at this speed.*

*The analysis evaluated sensitive receptors within 500 feet of the proposed bus storage facility. These sensitive receptors include residences, parks, and schools. The analysis addressed air pollution concentrations (including $PM_{10}$) associated with buses, including pollutant emissions associated with diesel exhaust fumes, at the proposed bus storage facility.*

*For the sensitive receptor locations identified near the proposed off-site bus storage facility, air quality is heavily influenced by three primary sources: (1) vehicular traffic using the grid of surface arterials in the area (e.g., Harrison Street, Bryant Street, Brannan Street, etc.); (2) traffic volumes on the elevated segment of Interstate 80 that crosses the project area carrying between 218,000 to 232,000 vehicles daily; and (3) the volume of urban bus traffic servicing the Transbay Terminal.*

*The influence and added contribution of these mobile sources on localized pollutant concentration levels was calculated using the Industrial Source Complex Short Term Phase 3 (ISCST3) dispersion model. This model is used throughout California as well as other states to compute short term pollutant concentrations from multiple sources on specific locations. The United States Environmental Protection Agency (USEPA) recognizes ISCST3 as an accepted regulatory air model.*

*Table 5.7-4 illustrates year 2020 concentrations, along with their corresponding California Ambient Air Quality Standard (CAAQS), of criteria pollutants that would have a direct effect on adjacent land uses because of their localized dispersion characteristics. Estimates are given both for the bus storage and layover area remaining near its current location as well as for the relocated storage area. These estimated Year 2020 concentrations include the ambient background plus localized sources modeled in ISCST3 such as surface street traffic, freeway traffic and bus operations surrounding the Transbay Terminal area. Ambient background*

*concentrations were added to ensure that a worst-case scenario would be calculated. The ISCST3 model calculated year 2020 pollutant concentrations through the inclusion of several line and area sources of pollutant emissions. Line sources included emissions from local street traffic within 500 feet of the storage facilities, emissions from bus traffic along access ramps leading in and out of existing and future facilities, bus circulation within the new storage areas, and freeway traffic from the elevated freeway. Area sources included emissions from idling buses in the current and future bus storage areas.*

*Pollution rates were derived using San Francisco County EMFAC2002 emission factors for the year 2020. For vehicle emissions on local streets and on the freeway, peak hour traffic volumes were multiplied by emission factors for model years 1975 (the earliest year in the model) to 2020. Bus emissions were calculated based on information provided for both AC Transit and Golden Gate Transit that included bus model years, fuel type, and the number of buses in use during peak hours. Bus emission factors were calculated based on the assumption that all buses in use in the year 2020 would be model year 2008 or higher and would be diesel buses.*

*Urban diesel bus idling emission factors are not provided by EMFAC2002. School diesel bus idling emission factors, however, are calculated in EMFAC2002. The characteristics of school diesel buses most closely match those of urban diesel buses, and for purposes of this analysis, idling emission factors for diesel school buses were substituted for the missing urban diesel bus emission factors. By using these emission factors, a worst-case scenario is anticipated in that urban buses are expected to be technologically superior to school buses in limiting the amount of pollutant emissions, and school buses would most likely generate higher pollutant concentrations.*

*As shown on the table, the supplemental air quality analysis concluded that pollutant concentrations would not exceed the CAAQS, which are designated to protect public health with an adequate margin of safety, and thus, would not have an adverse impact at any sensitive receptor locations. Additional information can be found in the Supplemental Air Quality Analysis Report, which is available for review by appointment at the Planning Department.*

*An important design feature of the bus storage facilities is the addition of a sound wall along the south perimeter of the area to mitigate noise impacts on surrounding residents (see Section 5.8.6). The sound wall would also serve the dual purpose of changing the dispersion pattern and effectively elevating the release height of pollutant emissions from buses circulating and idling in the bus storage area. Thus, the emission release height would be equal to the height of the wall. The higher the release height, the lower the pollutant concentration would be at adjacent sensitive receptors.*

*Pollutant concentrations at all receptors are expected to remain below the applicable CAAQS even without the inclusion of the sound wall. Therefore, the sound wall will provide even further assurance that pollution levels would not adversely affect residents adjacent to the bus storage facilities.*

**Table 5.7-4: Estimated Year 2020 Concentrations With and Without Bus Layover Storage Relocation [b]**

| *Sensitive Receptors* | | *CO (1 hr) ppm (CAAQS = 20)* | | *CO (8-hr) ppm (CAAQS = 9)* | | *$NO_X$ (1-hr) ppm (CAAQS = 0.25)* | | *$PM_{10}$ (24-hr) ug/m3 (CAAQS = 50)* | |
|---|---|---|---|---|---|---|---|---|---|
| *ID* | *Type* | *w/o* | *with* | *w/o* | *with* | *w/o* | *with* | *w/o* | *with* |
| *1* | *Residential-2nd and Bryant Streets* | *2* | *2* | *2* | *2* | *0.14* | *0.20* | *31* | *30* |
| *2* | *Residential-Stillman St. Between 2nd & 3rd Sts.* | *2* | *2* | *2* | *2* | *0.14* | *0.15* | *31* | *31* |
| *3* | *Residential-Stillman St. Between 2nd & 3rd Sts.* | *2* | *2* | *2* | *2* | *0.14* | *0.14* | *31* | *30* |
| *4* | *Residential-3rd and Stillman Streets* | *2* | *2* | *2* | *2* | *0.13* | *0.15* | *30* | *30* |
| *5* | *Residential-3rd and Bryant Streets* | *2* | *2* | *2* | *2* | *0.11* | *0.12* | *29* | *29* |
| *6* | *Residential-Bryant St. Between 2nd and 3rd* | *2* | *2* | *2* | *2* | *0.11* | *0.11* | *29* | *29* |
| *7* | *Residential-Bryant St. Between 2nd & 3rd Sts.* | *2* | *2* | *2* | *2* | *0.11* | *0.11* | *28* | *28* |
| *8* | *Residential-Bryant St. Between 2nd & 3rd Sts.* | *2* | *2* | *2* | *2* | *0.11* | *0.12* | *29* | *29* |
| *9* | *Residential-Park Ave. Between 2nd & 3rd Sts.* | *2* | *2* | *2* | *2* | *0.11* | *0.11* | *28* | *28* |
| *10* | *Residential-Park Ave. Between 2nd & 3rd Sts.* | *2* | *2* | *2* | *2* | *0.10* | *0.11* | *28* | *28* |
| *11* | *Residential-Park Ave. Between 2nd & 3rd Sts.* | *2* | *2* | *2* | *2* | *0.10* | *0.11* | *28* | *28* |
| *12* | *Park* | *2* | *2* | *1* | *1* | *0.09* | *0.10* | *27* | *27* |
| *13* | *Residential-3rd St. Between Bryant and Brannan Streets* | *2* | *2* | *1* | *1* | *0.09* | *0.10* | *27* | *27* |
| *14* | *Residential-3rd and Harrison Streets* | *2* | *2* | *2* | *2* | *0.13* | *0.16* | *30* | *31* |
| *15* | *Residential 3rd and Harrison Streets* | *2* | *2* | *2* | *2* | *0.11* | *0.11* | *29* | *29* |
| *16* | *School* | *2* | *2* | *2* | *2* | *0.11* | *0.11* | *28* | *28* |

*/a/ Concentrations include ambient background concentrations added to the concentrations calculated by the ISCST3 model for each pollutant.*

*Source: Terry A Hayes Associates LLC*

*The potential impact of pollutant trapping inside the storage area due to the sound wall and overhead freeway is regulated by the U.S. Occupational Safety and Health Administration's (OSHA) standards for air toxic exposure in the work place. OSHA has determined the interior threshold levels of CO, NOx, and PM10 air concentrations to be 50 ppm, 5 ppm, and 5000 µg/m3 respectively. These standards are well above the projected concentration levels of the pollutants inside the storage facility, as determined by the supplemental air quality impact analysis. Thus, no adverse air quality impact based on these standards would be anticipated. Should pollutant concentration levels exceed these limits, OSHA has established appropriate procedures for ventilating such pollutants to acceptable levels.*

*The criteria used to evaluate air quality impacts from the proposed project are the CAAQS. These outdoor air quality standards are adopted by the State's enforcement agency, the CARB, as provided for in the California Health and Safety Code section 39606. These standards set legal limits on outdoor air pollution and are designed to protect public health and welfare. Ambient air quality standards define clean air, and are established to protect even the most sensitive individuals. Typically, the outdoor CAAQS are more stringent and provide a wider margin of safety than indoor air quality standards promulgated by such agencies as OSHA.*

*An air quality standard defines the maximum amount of a pollutant that can be present in outdoor air without harm to the public's health. The standards are based on the CARB's on-going review of scientific studies on the health effects of individual air pollutants. As new scientific information on public health consequences becomes available the CAAQS are periodically revised. In light of new information and studies, CARB is responsible for determining whether CAAQS need to be revised to adequately protect human health, particularly sensitive population groups. For example, The Children's Environmental Health Protection Act (CEHPA, California Senate Bill 25, Escutia 1999) required the CARB and other state agencies to evaluate all ambient air quality standards by December 2000 to determine whether these standards adequately protect human health, particularly that of infants and children. The CEHPA also required staff to prioritize those standards found to be inadequate for full review and possible revision. The evaluation found that health effects may occur in infants, children, and other potentially susceptible groups exposed to pollutants at levels near several of the current standards, with PM10, ground-level ozone (O3) and nitrogen dioxide (NO2) receiving the highest priority for review and revision.*

### 5.7.*4* Conformity Assessment

FTA cannot approve funding for project activities beyond preliminary engineering until it has reviewed the project in accordance with the Environmental Protection Agency (EPA) transportation air quality conformity regulations (40 CFR Part 93) and has found that the project conforms. This regulation, which became effective in December 1993, establishes criteria for project conformity that cover all possible situations.

The RTIP has been demonstrated by MTC to conform to the state air quality implementation plan (SIP) for the Bay Area Air Basin. The carbon monoxide modeling results presented in Table 5.7-3 demonstrate that the Terminal/Extension Project will neither cause nor contribute to any carbon monoxide violations in the year 2020. The conformity criteria that the Terminal/Extension Project must satisfy and the status of the project in meeting these criteria are as follows.

•§93.110 The conformity determination must be based on the latest planning assumptions.

Assumptions used in the transportation and traffic analyses for this project, upon which the microscale carbon monoxide and regional criteria pollutant analyses are based, are derived from the MTC's most recently adopted population, employment, travel, and congestion estimates. Travel forecasts are based on MTC's growth assumptions for the Year 2020.

•§93.111 The conformity determination must be based on the latest emission estimation model available.

All emissions estimates are based on the latest available version of the California Air Resources Board's model. Carbon monoxide modeling was conducted using the CAL3QHC model.

•§93.112 The Metropolitan Planning Organization must make the conformity determination according to the consultation procedures of this rule and the implementation plan revision required by §51.390.

The most current SIP is called the Revised 2001 Bay Area Ozone Attainment Plan, which was adopted by the MTC, ABAG, and BAAQMD in October 2001 and by ARB in November 2001. The EPA's approval of the Bay Area mobile source emissions budget was published in the Federal Register in February 2002 allowing MTC to make a conformity finding on the 2001 RTP. MTC's, FHWA's and FTA's conformity approval in March 2002 lifted the conformity lapse that had existed in the region since January 2002.[15] MTC's followed the consultation procedures in 40 CFR Part 93, as amended.

•§93.114 There must be a currently conforming transportation plan and currently conforming TIP at the time of project approval.

The current transportation plan and TIP are, respectively, the 2001 Regional Transportation Plan (RTP) and the *2003* Regional Transportation Improvement Program (RTIP). *The air quality conformity analysis for the 2001 RTP was approved by MTC in March 2002. The 2003 TIP was federally approved in February 2003. The proposed project is included in the 2003 TIP.*

[15] Under new FHWA/FTA guidance, circulation of this draft EIS/EIR would have been allowed, with or without a conformity lapse. However, FTA can make a finding of conformity in the Final EIS/EIR for this project only following the lifting of the conformity lapse.

•§93.115 The project must come from a conforming transportation plan and program.

The Transbay Terminal / Caltrain Downtown Extension / Redevelopment Project is included as one of the top funding priorities in the financially constrained portion (called "Track 1") of the Regional Transit Expansion Policy (RTEP).[16] The RTEP is the transit element of the 2001 Regional Transportation Plan (RTP). The 2001 RTP, including the RTEP, was adopted by the *MTC* in December 2001.

•§93.116 The FHWA/FTA project must not cause or contribute to any new localized carbon monoxide or $PM_{10}$ violations or increase the frequency or severity of any existing carbon monoxide and $PM_{10}$ violations in carbon monoxide and $PM_{10}$ nonattainment and maintenance areas.

By its nature, the Terminal/Extension Project would result in changes in travel patterns and concentrations of motor vehicle traffic in the vicinity of the Transbay Terminal area, which would cause small increases in pollutant concentrations for these road segments, but no standards would be violated. At the same time, the proposed project would result in a decrease in regional vehicle trips and vehicle miles of travel, which would reduce the emission of criteria pollutants, when compared to the No-Project Alternative.

The microscale carbon monoxide analysis indicates that the project would neither cause nor contribute to new carbon monoxide violations during operation. The source of $PM_{10}$ emissions typically associated with transportation is the effect of tires stirring up dust on roadways. $PM_{10}$ is not associated with electric commuter rail transit operations. The project can be considered beneficial in terms of $PM_{10}$, in that it would remove vehicle trips from area roadways.

•§93.117 The FHWA/FTA project must comply with $PM_{10}$ control measures in the applicable implementation plan.

The project would comply with all $PM_{10}$ control measures in the most recent SIP document for the region.

•§93.118 The transportation plan and TIP must be consistent with the motor vehicle emissions budget(s) in the applicable implementation plan (or implementation submission).

The RTP and RTIP are consistent with the motor vehicle emissions budget in the applicable implementation plan, as indicated by the MTC's approval of the conformity analysis in December 2001.

[16] The Project is identified as the "Caltrain Downtown Extension/Rebuilt Transbay Terminal" in the RTEP and RTP.

No exceedences of state or federal AAQS are projected under either alternative in the future analysis year of 2020, and no mitigation is proposed for long-term air quality effects resulting from project operation.

## 5.8 NOISE AND VIBRATION

This section analyzes anticipated increases in noise and vibration resulting from the proposed project. Sources of noise and vibration considered include airborne noise from trains operating along Seventh and Townsend Streets south and west of the subway portal near Fifth Street, traffic noise from any increases in traffic volumes or changes in traffic patterns, storage yard noise, and ground-borne vibration from trains operating both above and below ground.

### 5.8.1 Sensitive Receptors

A visual survey of the project area was conducted to determine the location of residential land uses (including live/work units) that might be affected by changes in noise or vibration. Noise monitoring sites identified in Section 4.7 and shown in Figure 4.7-1 were selected to satisfy the conditions of being noise-sensitive receptors and being representative of other neighborhoods in the study area with similar noise characteristics. Residential land uses are generally considered most sensitive to changes in noise and vibration, except where research or manufacturing activities require vibration sensitive instrumentation or where background noise can pose a problem, such as in recording studios. Although multi-media companies are located within the study area, their operations are not uniquely sensitive to outside noise and vibration except where studio recordings are being prepared. Based on a visual survey of the study area, the closest recording studio is approximately 700 feet from the proposed Caltrain Downtown Extension alignments, and impact from rail noise or vibration is therefore extremely unlikely.

### 5.8.2 FTA Criteria for Noise and Vibration

The FTA noise impact criteria[17] are founded on well-documented research on community reaction to noise and are based on change in noise exposure using a sliding scale. The amount that the transit project is allowed to change the overall noise environment is reduced with increasing levels of existing noise. FTA's noise criteria consider the combination of existing noise exposure and project-specific increases in relation to three sensitive land use categories:

- Category 1: buildings or parks where quiet is an essential element of their purpose;
- Category 2: residences and buildings where people normally sleep; and
- Category 3: institutional land uses with primarily daytime and evening use (e.g., schools, libraries, churches).

[17] Transit Noise and Vibration Impact Assessment, Federal Transit Administration, 1995.

There are two levels of impact included in the FTA criteria: "severe" and "impact":

- **Severe**: Severe noise impacts are considered "significant" as this term is used in the National Environmental Policy Act (NEPA) and implementing regulations. Noise mitigation will normally be specified for severe impact areas unless there is no practical method of mitigating the noise.
- **Impact**: This range is sometimes referred to as moderate impact. In this range, other project-specific factors are considered to determine the magnitude of the impact and the need for mitigation. Other factors can include predicted increases over existing noise levels, types and numbers of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost effectiveness of mitigating noise to more acceptable levels.

Noise impact criteria are summarized in Table 5.8-1. The first column shows the existing noise exposure, and the remaining columns show the additional noise exposure caused by the transit project. Future noise exposure would be the combination of the existing noise exposure and the additional noise exposure caused by the project.

Table 5.8-2 gives the information from Table 5.8-1 in terms of the allowable increase in cumulative noise exposure (noise from existing sources plus project noise) as a function of existing noise exposure. As the existing noise exposure increases, the amount that the transit project can increase the overall noise exposure before there is impact decreases.

Vibration criteria for three categories of sensitive receptors are summarized in Table 5.8-3. Ground-borne vibration from transit trains is characterized in terms of the root mean square (RMS) vibration velocity amplitude. A one second RMS time constant is assumed. This is in contrast to vibration from blasting and other construction procedures that have the potential of causing building damage. It is very rare that ground-borne vibration from any type of train operations will be high enough to cause any sort of building damage, even minor cosmetic damage. The only real concern is that the vibration will be intrusive to building occupants or interfere with vibration sensitive equipment.

The threshold of vibration perception for most humans is around 65 VdB, levels in the 70 to 75 VdB range are often noticeable but acceptable, and levels in excess of 80 VdB are often considered unacceptable. For urban transit systems with 10 to 20 trains per hour throughout the day, limits for acceptable levels of residential ground-borne vibration are usually between 70 and 75 VdB.

For human annoyance, there is some relationship between the number of events and the degree of annoyance caused by the vibration. More frequent vibration events, or events that last longer, will be more annoying to building occupants. To account for this effect, FTA's Guidance Manual includes an eight VdB higher impact threshold if there are fewer than 70 trains per day.

Because it is projected that as many as 132 trains per day would eventually use the proposed tunnel, the adjustment for infrequent events is not applicable.

**Table 5.8-1: FTA Noise Impact Criteria**

| Existing Noise Exposure* $L_{eq}$ or $L_{dn}$ | Project Noise Exposure Impact Thresholds (dBA) | | | |
|---|---|---|---|---|
| | Category 1 or 2 Sites | | Category 3 Sites | |
| | Impact | Severe Impact | Impact | Severe Impact |
| <43 | Amb.+10 | Amb.+15 | Amb.+15 | Amb.+20 |
| 43-44 | 52 | 58 | 57 | 63 |
| 45 | 52 | 58 | 57 | 63 |
| 46-47 | 53 | 59 | 58 | 64 |
| 48 | 53 | 59 | 58 | 64 |
| 49-50 | 54 | 59 | 59 | 64 |
| 51 | 54 | 60 | 59 | 65 |
| 52-53 | 55 | 60 | 60 | 65 |
| 54 | 55 | 61 | 60 | 66 |
| 55 | 56 | 61 | 61 | 66 |
| 56 | 56 | 62 | 61 | 67 |
| 57-58 | 57 | 62 | 62 | 67 |
| 59-60 | 58 | 63 | 63 | 68 |
| 61-62 | 59 | 64 | 64 | 69 |
| 63 | 60 | 65 | 65 | 70 |
| 64 | 61 | 65 | 66 | 70 |
| 65 | 61 | 66 | 66 | 71 |
| 66 | 62 | 67 | 67 | 72 |
| 67 | 63 | 67 | 68 | 72 |
| 68 | 63 | 68 | 68 | 73 |
| 69 | 64 | 69 | 69 | 74 |
| 70 | 65 | 69 | 70 | 74 |
| 71 | 66 | 70 | 71 | 75 |
| 72-73 | 66 | 71 | 71 | 76 |
| 74 | 66 | 72 | 71 | 77 |
| 75 | 66 | 73 | 71 | 78 |
| 76-77 | 66 | 74 | 71 | 79 |
| >77 | 66 | 75 | 71 | 80 |

**Notes:** * $L_{dn}$ is used for land uses where nighttime sensitivity is a factor; 1-hour $L_{eq}$ is used for land use involving only daytime activities.

**Source:** Transit Noise and Vibration Impact Assessment, Federal Transit Administration, 1995.

**Table 5.8-2: Increase in Cumulative Noise Levels Allowed by FTA Criteria**

| Existing Noise Exposure* $L_{eq}$ or $L_{dn}$ | Impact Threshold for Increase in Cumulative Noise Exposure(dBA) | | | |
|---|---|---|---|---|
| | Category 1 and 2 Sites | | Category 3 Sites | |
| | Impact | Severe Impact | Impact | Severe Impact |
| 45 | 8 | 14 | 12 | 19 |
| 46 | 7 | 13 | 12 | 18 |
| 47 | 7 | 12 | 11 | 17 |
| 48 | 6 | 12 | 10 | 16 |
| 49 | 6 | 11 | 10 | 16 |
| 50 | 5 | 10 | 9 | 15 |
| 51 | 5 | 10 | 8 | 14 |
| 52 | 4 | 9 | 8 | 14 |
| 53 | 4 | 8 | 7 | 13 |
| 54 | 3 | 8 | 7 | 12 |
| 55 | 3 | 7 | 6 | 12 |
| 56 | 3 | 7 | 6 | 11 |
| 57 | 3 | 6 | 6 | 10 |
| 58 | 2 | 6 | 5 | 10 |
| 59 | 2 | 5 | 5 | 9 |
| 60 | 2 | 5 | 5 | 9 |
| 61 | 1.9 | 5 | 4 | 9 |
| 62 | 1.7 | 4 | 4 | 8 |
| 63 | 1.6 | 4 | 4 | 8 |
| 64 | 1.5 | 4 | 4 | 8 |
| 65 | 1.4 | 4 | 3 | 7 |
| 66 | 1.3 | 4 | 3 | 7 |
| 67 | 1.2 | 3 | 3 | 7 |
| 68 | 1.1 | 3 | 3 | 6 |
| 69 | 1.1 | 3 | 3 | 6 |
| 70 | 1.0 | 3 | 3 | 6 |
| 71 | 1.0 | 3 | 3 | 6 |
| 72 | 0.8 | 3 | 2 | 6 |
| 73 | 0.6 | 2 | 1.8 | 5 |
| 74 | 0.5 | 2 | 1.5 | 5 |
| 75 | 0.4 | 2 | 1.2 | 5 |

**Notes:**
* $L_{dn}$ is used for land uses where nighttime sensitivity is a factor; 1-hour $L_{eq}$ is used for land use involving only daytime activities.

**Source:** Transit Noise and Vibration Impact Assessment, Federal Transit Administration, 1995.FTA Noise/Vibration Criteria, 2001.

**Table 5.8-3: Ground-Borne Vibration and Noise Impact Criteria**

| Land Use Category | Ground-Borne Vib. Impact (VdB re 1 micro-inch/sec) | | Ground-Borne Noise Impact (dB re 20 micro-Pascals) | |
|---|---|---|---|---|
| | Frequent [1] Events | Infrequent [2] Events | Frequent [1] Events | Infrequent [2] Events |
| **Category 1**: Buildings where low ambient vibration is essential for interior operations. | 65 VdB [3] | 65 VdB[3] | - [4] | - [4] |
| **Category 2**: Residences and buildings where people normally sleep. | 72 VdB | 80 VdB | 35 dBA | 43 dBA |
| **Category 3**: Institutional land uses with primarily daytime use. | 75 VdB | 83 VdB | 40 dBA | 48 dBA |

Notes:
[1] Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
[2] "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
[3] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
[4] Vibration-sensitive equipment is not sensitive to ground-borne noise.

Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, 1995.

There are some buildings, such as concert halls, TV and recording studios, and theaters that can be very sensitive to vibration and noise but do not fit into any of the three categories shown in Table 5.8-3. Because of the sensitivity of these buildings, they usually warrant special attention during the environmental assessment of a transit project. Table 5.8-4 gives criteria for acceptable levels of ground-borne vibration and noise for various types of special buildings.

**Table 5.8-4: Ground-Borne Vibration and Noise Impact Criteria for Special Buildings**

| Type of Building or Room | Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch/sec) | | Ground-Borne Noise Impact Levels (dB re 20 micro-Pascals) | |
|---|---|---|---|---|
| | Frequent [1] Events | Infrequent [2] Events | Frequent [1] Events | Infrequent [2] Events |
| Concert Halls | 65 VdB | 65 VdB | 25 dBA | 25 dBA |
| TV Studios | 65 VdB | 65 VdB | 25 dBA | 25 dBA |
| Recording Studios | 65 VdB | 65 VdB | 25 dBA | 25 dBA |
| Auditoriums | 72 VdB | 80 VdB | 30 dBA | 38 dBA |
| Theaters | 72 VdB | 80 VdB | 35 dBA | 43 dBA |

Notes: [1] "Frequent Events" is defined as more than 70 vibration events/day. Most transit projects fall into this category.
[2] "Infrequent Events" is defined as fewer than 70 vibration events/day. This category includes most commuter rail systems.
[3] If the building will rarely be occupied when the trains are operating, there is no need to consider impact. As an example, consider a commuter rail line next to a concert hall. If no commuter trains will operate after 7 pm, it should be rare that the trains interfere with the use of the hall.
Source: Harris Miller Miller and Hanson, 2001

### 5.8.3 Train Noise

The Caltrain Downtown Extension is the only component of the proposed project that would result in train noise. For both the Second-to-Main and Second-to-Mission Alternative, the proposed rail line would be in a tunnel, except for a short section south of the intersection of Seventh Street and Townsend Street. This is the only track section where train operations have potential to create noise impact. The land use along this segment of the alignments is almost exclusively commercial and industrial. In a walking survey, the closest noise sensitive receptors were found to be live/work lofts on Townsend Street, more than 1,500 feet from the subway portal. There is no impact predicted at this building from the train noise.

### 5.8.4 Traffic Noise

#### 5.8.4.1 Methodology

The traffic noise impact assessment was based on a comparison of the Transbay Terminal/ Caltrain Downtown Extension/Redevelopment Alternatives to the No-Project Alternative. A screening procedure was used to locate areas of potential noise impact where a more detailed assessment of traffic noise may be required. Areas were identified in which the projected increase in traffic volume (under the "worst case conditions" – i.e., Full Build Alternative) could cause a noticeable increase in noise exposure at residential land uses and other noise-sensitive receptors in the study area. It is generally assumed that a two to three dBA increase in noise exposure is required before residents consider the increase to be of any consequence. This translates to an increase in traffic volume of at least 60 percent before there is potential for noise impact. The screening procedure used was based on the logarithmic ratio of the project alternatives to the No-Project Alternative. The formula used was:

| Approximate Change in Noise Exposure = 10 x log (No. of vehicles/No. of base vehicles). |
|---|

All areas where the approximate increase in noise exposure exceeded one dBA were identified. The Full Build Alternative and No-Project traffic volumes were derived from the one-hour turning movements results for all the streets in the study area using the traffic studies performed by the San Francisco County Transportation Authority. This included numbers for afternoon and morning peak hours.

#### 5.8.4.2 Results of Traffic Noise Analysis

The noise predicted at each of the street sections for the project alternatives was compared to the future No-Project Alternative. Results of the traffic noise analysis are summarized in Table 5.8-5. The table lists street sections and corresponding cross streets where there is at least a one dBA increase in either direction. The numbers for both directions are included to provide a complete picture along the segment being analyzed. The modeled number of vehicles for the

Full Build and No-Project Alternatives are also shown. The last column shows the decibel increase (or decrease, as the case may be) for the build Alternatives as compared to the No-Project Alternative. A traffic volume increase of 25 percent or greater is necessary for a one-decibel increase in noise exposure.

**Table 5.8-5: Summary of Traffic Noise Analysis**

| Street | Dir. | From Street | To Street | TOTAL Vehicles | | Approximate Change in Noise Level (dBA) |
|---|---|---|---|---|---|---|
| | | | | No Project | Build | |
| **Weekday PM Peak Hour** | | | | | | |
| 1. Mission St. | NE | First St. | Fremont St. | 639 | 817 | 1 |
| | SW | Fremont St. | First St. | 637 | 700 | 0 |
| 2. Howard St. | SW | Beale St. | Fremont St. | 1461 | 1843 | 1 |
| | NE | Fremont St. | Beale St. | 350 | 390 | 0 |
| 3. Howard St. | SW | Main St. | Beale St. | 830 | 1324 | 2 |
| | NE | Beale St. | Main St. | 410 | 455 | 0 |
| 4. Folsom St. | NE | First St. | Fremont St. | 1063 | 1345 | 1 |
| 5. Folsom St. | NE | Fremont St. | Beale St. | 1015 | 1272 | 1 |
| 6. Folsom St. | SW | Spear St. | Main St. | 136 | 290 | 3 |
| | NE | Main St. | Spear St. | 780 | 878 | 1 |
| 7. Folsom St. | NE | Spear St. | The Embarcadero | 967 | 1086 | 1 |
| | SW | The Embarcadero | Spear St. | 183 | 264 | 2 |
| 8. Harrison St. | NE | First St. | Fremont St. | 84 | 130 | 2 |
| | SW | Fremont St. | First St. | 1431 | 1547 | 0 |
| 9. Beale St. | SE | Howard St. | Folsom St. | 975 | 1314 | 1 |
| 10. Spear St. | SE | Howard St. | Folsom St. | 563 | 813 | 2 |
| 11. Main St. | SE | Folsom St. | Harrison St. | 195 | 252 | 1 |
| | NW | Harrison St. | Folsom St. | 334 | 456 | 1 |

**Source:** San Francisco County Transportation Authority, Harris Miller Miller & Hanson, Wilbur Smith Associates, 2001.

There are a total of eleven road segments where a noise exposure increase of one decibel or greater is projected for the build alternatives during the weekday PM peak hour. The areas with the greatest traffic increases and the potential for noise impacts are:

- Mission Street between First Street and Fremont Street. The land use in this area is almost exclusively commercial and office space. No noise impact from the increased traffic noise is projected.
- Howard Street between Fremont Street and Main Street. There are no noise-sensitive receptors in this area.
- Folsom Street between First Street and Beale Street. The land use in this area is primarily office space, industrial space, and parking, with some residential space near Folsom and Beale Streets. No noise impact from the increased traffic noise is projected.

- Folsom Street between Main Street and The Embarcadero. The land use in this area is mostly office space and parking. Between Main and Spear Streets, the hourly traffic volume in the southwest direction is projected to increase from 136 vehicles per hour to 290 vehicles per hour. Since traffic volume in the opposite direction is approximately 800 to 900 vehicles per hour, the volume increase in the southwest direction will not contribute significantly to noise exposure when compared to the volume in the northeast direction. Therefore, no noise impact from the increased traffic noise is projected.
- Harrison Street between First Street and Fremont Street. The hourly traffic volume in the northeast direction is projected to increase from 84 vehicles per hour to 130 vehicles per hour. Since traffic volume in the opposite direction is approximately 1,500 vehicles per hour for the No-Project Alternative, the volume increase in the northeast direction will not affect overall noise exposure and no impact is projected.
- Beale Street between Howard Street and Folsom Street. There are no noise-sensitive receptors in this area.
- Spear Street between Howard Street and Folsom Street. The land use in this area is mostly office space. No noise impact from the increased traffic noise is projected.
- Main Street between Folsom Street and Harrison Street. The land use in this area is mostly office space and parking. No noise impact from the increased traffic noise is projected.

In no case does the projected noise exposure increase exceed one decibel in both directions. In residential areas, the projected change in noise exposure does not exceed one decibel. In other office, industrial, commercial, and parking areas, the projected change in noise exposure does not exceed three decibels. The potential noise exposure increase for all other road segments is clearly below FTA impact thresholds.

### 5.8.5 Caltrain Storage Yard Noise

Normally storage yards and layover facilities can be a significant source of noise because much of the activity takes place during nighttime or early morning hours. Diesel locomotives are required to idle for a short amount of time before starting revenue service operations and are usually a source of annoyance near storage yards.

A live/work loft at 388 Townsend Street is currently the only residential area near the planned storage yard. A lot located to the southwest is expected to undergo residential development in the near future and was included in the noise assessment. Under existing conditions, noise at both the live/work loft on Townsend and the proposed new residential development is often dominated by Caltrain noise, trains entering or departing the station, or idling locomotives.

Projections are that the proposed project will result in lower noise levels at both noise sensitive receptors near the storage yard because most locomotives would be electric instead of the current diesel. This would virtually eliminate the noise from idling locomotives.

### 5.8.6 Bus Storage Facility Noise

Noise would also be generated by operations at the bus storage facilities proposed beneath the Bay Bridge approach (between Fourth and Third Streets, between Third and Second Streets, and immediately east of Second Street). Noise would occur as vehicles enter and exit these storage lots, and while engines warm up before starting revenue operations.

*In response to public comment on the Draft EIS/EIR, a supplemental noise assessment was made of the proposed permanent off-site bus storage facility under the Western Approach to the Bay Bridge between Second and Fourth Streets. The assessment was conducted using bus source noise levels and noise projection formulas contained in the FTA Guidance Manual. Noise projections were made for noise sensitive receptors near the bus storage facility and compared with the appropriate impact criteria. Where noise impact is projected, mitigation measures are recommended.*

*Existing noise conditions were based on the nearest long-term noise measurement conducted as a part of the noise and vibration study for the EIS/EIR. Long-term (24-hour) noise measurements were made in July 1995 at a parking lot near the intersection of Brannan and Second Street. This measurement was used to characterize the ambient noise at sensitive receptors near the proposed bus storage facility.*

*Since the bus facility would be in use only during the morning and evening peak-hour periods, the noise assessment was based on the existing ambient hourly Leq for the hours of operation of the bus storage facility. Table 5.8-6 summarizes the measurement results for the time periods that the bus storage facility would be in use. The hourly Leqs shown in the table were used in the assessment of noise impact at sensitive receptors near the bus storage facility.*

***Table 5.8-6: Existing Noise Levels***

| *Site #* | *Location* | *Date* | *Time* | *Hourly Leq (dBA)* |
|---|---|---|---|---|
| *1* | *Parking Lot (Brannan & Second)* | *7/95* | *7:00am* | *64* |
| | | *7/95* | *8:00am* | *68* |
| | | *7/95* | *4:00pm* | *61* |
| | | *7/95* | *5:00pm* | *61* |
| | | *7/95* | *6:00pm* | *62* |

*The methodology used for the impact assessment follows that described in the detailed noise assessment section of the FTA Guidance Manual. Projections of Project noise levels from the bus storage facility were based on source noise levels contained in the FTA Guidance Manual and formulas for projecting noise from both bus idling and bus operations. The operations data, including information on the number of buses using the facility, bus speeds in the facility and on the ramp, and durations of bus idling in the facility during the afternoon is based on the terminal facility operations assumed as part of the Project. For purposes of analysis, it was assumed that approximately 104 buses (71 Golden Gate Transit buses and 33 AC Transit buses) would enter the proposed storage facility in the peak morning hour of 8:00 AM. In addition, a total of 119 buses (67 Golden Gate Transit buses and 52 AC Transit buses) would leave the proposed storage facility, and a total of 57 AC Transit buses would arrive at the proposed storage facility during the peak afternoon hour of 4:00 PM. Buses were assumed to be traveling at a speed of 15 mph on average and idling for approximately three minutes in the storage facility before leaving in the afternoon. In the morning, Golden Gate Transit buses would gain access the storage facility via Fourth Street at Perry and AC Transit buses would gain access to the facility via the ramp structure east of Second Street. In the afternoon, both the Golden Gate Transit and AC Transit buses would use the dedicated ramp when leaving the proposed storage facility.*

*The projected noise levels for the peak hour of activity (4:00 PM) at the closest noise-sensitive receptors adjacent to the storage facility are shown in Table 5.8-7. The results indicate that noise impacts are projected at residences to the north and south of the AC Transit storage facility.*

***Table 5.8-7: Bus Storage Facility Projected Noise Levels***

| *Location* | *Sound Level (Leq, dBA)* | | *FTA Noise Impact Criteria (Leq, dBA)* | | *Impact?* |
|---|---|---|---|---|---|
| | *Existing* | *Project* | *Impact* | *Severe* | |
| *Residences North of AC Transit Facility at Perry and Third Street* | 61 | 66 | 59 | 64 | *Severe* |
| *Residences South of AC Transit Facility along Stillman Street* | 61 | 62 | 59 | 64 | *Impact* |
| *Residences South of the Golden Gate Transit Facility along Stillman Street* | 61 | 59 | 59 | 64 | *Impact* |
| *Residences South of AC Transit Facility along Stillman Street* | 61 | 55 | 59 | 64 | *No* |

*Source: Harris Miller Miller, Hanson, 2003.*

### 5.8.7 Noise Mitigation

Based on this analysis, there appears to be no need to mitigate train noise, traffic noise, or Caltrain storage yard noise.

*Based on the results of the noise assessment, mitigation is recommended at three locations adjacent to the bus storage facility. The proposed noise mitigation locations are:*

- *Residences North of the AC Transit Facility. Severe noise impact is projected for the residences to the north of the AC Transit facility at the corner of Perry and Third Street. Because of the configuration of the site, noise barriers are not an option for noise mitigation. Therefore, sound insulation will be installed to mitigate the noise impacts at this location. At a minimum, sound insulation will be applied to the façade facing the bus storage facility (the south façade).*

- *Residences South of the AC Transit Facility. Noise impact is projected for the residences to the south of the AC Transit facility along Stillman Street. For these residences, a combination of two barriers would mitigate the noise impacts. The first noise barrier will be approximately 10-12 feet high and run along the southern edge of the AC Transit storage facility. The second noise barrier will be approximately 5-6 feet high and will be located on the portion of the ramp at the southwestern corner of the AC Transit facility. To minimize the potential for reflections off the underside of the freeway, noise barriers will be treated with an absorptive material on the side facing the facility.*

- *Residences South of the Golden Gate Transit Facility. Noise impact is projected for the residences to the south of the Golden Gate Transit facility along Stillman Street. A noise barrier would mitigate the impacts. The barrier will be approximately 10-12 feet high and run along the southern and a portion of the eastern edge of the Golden Gate Transit storage facility. To minimize the potential for reflections off the underside of the freeway, the noise barriers will be treated with an absorptive material on the side facing the facility.*

*Noise* wall*s* will be landscaped, although the actual design will be developed in cooperation with area residents. *The walls will be constructed prior to the development of the permanent bus facilities.*

### 5.8.8 Ground-Borne Vibration

#### 5.8.8.1 Methodology

The ground-borne vibration and ground-borne noise projections are based on the force density curve developed from train noise tests described in Section 4.7, and based on transfer mobility data derived from vibration propagation tests described in Section 4.7. One factor that the vibration analysis has not been able to account for is that only electric locomotives would be used in the new tunnel, and these electric-powered locomotives will generate different vibration levels than the existing diesel locomotives.

Another factor that could not be accounted for is that, in many cases, the subway structure will be founded in bedrock and the building foundations will be in soil, sometimes supported by piles that have been driven down to the bedrock. The vibration path from the subway foundation though the bedrock, into the soil overburden and finally into the building foundation will tend to be a less efficient vibration path than what was measured at the vibration test sites. Vibration propagation tests were all performed at the surface, meaning that the testing force was in the soil layer rather than the rock layer.

The vibration projections are based on the most representative vibration propagation test. All of the ground-borne vibration projections include a five decibel "safety factor" to account for vibration amplification that will occasionally be caused when floor resonances are excited by the ground vibration, and to account for the normal fluctuation in ground-borne vibration caused by variations in ground conditions.

In most cases, the measurements were at closer distances than the subway would be. The additional distance was accounted for using the attenuation curves from the propagation tests at sites VP2 and VP3. These were the only sites in the corridor where there was sufficient open space to obtain information on vibration attenuation with distance.

#### 5.8.8.2 Results of Ground-Borne Vibration Analysis

Vibration projections were developed for all buildings along Townsend and Second streets that appear to have residential occupants. Projections of ground-borne vibration and ground-borne noise were developed for all buildings along the proposed corridor that were identified as having residential uses. These include live/work lofts, apartment buildings, row houses, and a new hotel under construction that was under construction during the testing. The vibration projections are summarized in Table 5.8-6.

Buildings at which vibration impacts are projected without mitigation are listed below.

- **388 Townsend Street:** The projections indicate vibration levels will exceed the FTA 72 VdB impact threshold by three VdB, and the ground-borne noise will exceed the 35 dBA impact threshold by 10 dBA.

- **Clocktower Building:** Projected vibration levels exceed the FTA impact threshold by two VdB at the hallway site.

- **Second Street Apartment Building and new Marriott Courtyard:** The projections at these two buildings are based on the measurements at the Marine Firefighter's Union building. It was not possible to obtain permission to test at the apartment building and the Marriott Courtyard was still under construction. The projections at the test location closest to the front of the building exceed the vibration and noise impact thresholds by less than one VdB. No mitigation is indicated.

*After mitigation, groundborne noise impact at 388 Townsend Street and vibration impact at the Clocktower Building would still exceed the impact threshold by one decibel. This level of impact would not constitute a substantial adverse change requiring further mitigation, in terms of FTA guidance. The next level of mitigation that would be effective would be to install floating slab under the Caltrain alignment trackage for 600 to 800 feet on either side of each building (at a construction cost of $1,000 per linear foot), which would add installed costs approaching one million dollars or even more per building. Such high mitigation costs would not be a prudent and reasonable expenditure to eliminate the last one decibel of impact at these two sites.*[18]

There are *four* buildings at which projected vibration exceeds FTA impact thresholds. Only one location – 388 Townsend Street – is projected to exceed the FTA thresholds by more than a marginal amount.

[18] Per FTA guidelines, "to be feasible, the measure, or combination of measures, must be capable of providing a significant reduction of the vibration levels, at least 5 dB, while being reasonable from the standpoint of the added cost."

**Table 5.8-8: Summary of Vibration Projections**

| Location | Horiz. Distance (feet) | Depth to Top of Rail (ft) | Train Speed (mph) | Without Mitigation (stiff DF fasteners) | | With Mitigation (resilient track system) | |
|---|---|---|---|---|---|---|---|
| | | | | Vib. (VdB) | Noise (dBA) | Vib. (VdB) | Noise (dBA) |
| **Live/Work Condos, 388 Townsend Street (VP0, Hubbell and Seventh)** | | | | | | | |
| Front rooms | 70 | 32 | 35 | **75** | **45** | 72 | **36** |
| **San Francisco Residences on Bryant (VP2, Harrison Parking Lot Site)** | | | | | | | |
| Building 1 | 120 | 74 | 35 | 61 | 28 | -- | -- |
| Building 2 | 150 | 74 | 35 | 60 | 26 | -- | -- |
| Building 3 | 170 | 74 | 35 | 59 | 25 | -- | -- |
| **Clock Tower Building (VP4)** | | | | | | | |
| Hallway | 30 | 82 | 35 | **74** | **38** | **73** | 33 |
| Elevator | 30 | 82 | 35 | 72 | 29 | 72 | 25 |
| Room 132 | 30 | 82 | 35 | 70 | 25 | 70 | 21 |
| Room 131 | 30 | 82 | 35 | 69 | 18 | 69 | 16 |
| 2nd Floor Stair | 30 | 82 | 35 | 66 | 28 | 65 | 22 |
| **Second Street High Rise and new Marriott Courtyard (VP1, Marine Firefighter's Union)** | | | | | | | |
| Inside, 16 ft | 30 | 69 | 35 | **73** | **35** | 72 | 31 |
| Inside, 37 ft | 30 | 69 | 35 | 69 | 30 | 68 | 26 |
| Inside, 58 ft | 30 | 69 | 35 | 65 | 23 | 64 | 20 |

Notes:
All projections include a five-decibel safety factor to account for potential that there will be amplification from floor resonances and to allow for normal fluctuations caused by variations in ground conditions.

Numbers in bold indicate where projections exceed the FTA impact threshold for residential land uses. The applicable thresholds are 72 VdB for ground-borne vibration and 35 dBA for ground-borne noise.

Source: Harris Miller Miller and Hanson, 2001.

### 5.8.8.3 Vibration Mitigation

As shown in Table 5.8-6, the projected ground-borne vibration and ground-borne noise levels can be mitigated with the use of high-resilience track fasteners or a resiliently supported tie system. With this mitigation measure, the projected vibration levels would be reduced by zero to three VdB, and the projected noise levels would be reduced by four to nine dBA.[19]

[19] The variation is caused by the differences in the frequency spectrum of the vibration.

## 5.9 GEOLOGY AND SEISMICITY

This section focuses on the potential for geologic or seismicity features of the project area to affect the proposed project, or for the project to increase the potential exposure of people to hazard from geologic or seismic risks. In this context, the No-Project Alternative does not have potential impacts, but serves as a basis of comparison with the Project Extension Alternatives.

### 5.9.1 Geology

The primary geologic elements that could affect the proposed project include Bay Mud and artificial fill. Impacts associated with these elements can be mitigated through appropriate design and are discussed below.

For the Transbay Terminal and Redevelopment sites, fill soils possess adverse characteristics such as rubble, heterogeneity of composition and depth, and locally high permeability. Similar to Bay Mud, these characteristics could affect the stability of excavations and resultant ground deformations.

Bay Mud overlain by artificial fill would be encountered beneath the southwestern portions of the Caltrain Downtown Extension alternatives, and would be the primary factor potentially affecting non-seismic settlement of the storage yard, surface tracks, rail stations, and cut-and-cover subways.

Differential settlement of Bay Mud is expected to occur within the storage yard and along the surface tracks; however, the degree of settlement is expected to be relatively minor. Without appropriate foundation support, settlement of the rail facilities would occur due to the presence of the mud. With respect to cut-and-cover and station construction, the low strength and moderate deformation characteristics of Bay Mud could affect the stability of the face of the tunnel, the stability of excavations, the degree of ground deformation caused by the excavations, and the resulting response of adjacent structures.

Core drillings were taken in the corridor in 1996, and the rock was identified as "fractured rock." A panel of experts[20] recommended that a "specialized tunneling" technique known as "spiling" be used in this rock. Because the proposed Caltrain Extension Alternatives Tunneling Option includes a larger tunnel (three tracks instead of two) than was proposed in 1996 and would pass under historic structures, a tunneling technique known as "stacked drift" is now proposed. This technique, which is designed to assure no tunnel collapse, is described in the Construction Section 5.20. Additional core drillings are proposed along the tunneling portion of the Caltrain Extension Alternatives to assure that this is the best tunneling approach.

[20] The panel included professor Thomas D. O'Rourke of Cornell University, Professor Tor L. Brekke of the University of California, Berkeley, and Mr. Norman A. Nadel, of Nadel Associates, Brewster, New York. The Panel was chaired by Demetrious Koutsoftas, URS, San Francisco, who has extensive experience with development and tunnel projects in the Project Area and a substantial knowledgeable regarding the Project area's geology.

### 5.9.2 Seismicity

Seismically-induced ground shaking could damage a new Transbay Terminal, Caltrain Downtown Extension, or new development. The primary hazards related to seismically-induced ground motion are liquefaction and associated ground deformation (e.g., subsidence and lateral spreading). Portions of the Transbay Terminal/Caltrain Extension, and redevelopment sites are underlain by soft sediments that are susceptible to amplified ground motion.

Seismic shaking may cause subsidence and lateral spreading of the ground surface as a result of liquefaction of saturated fill soils. This type of ground deformation could damage or obstruct the surface train lines or limit the use of the new Transbay Terminal or Caltrain storage yard and surface tracks until track repairs are completed. Up to 50 feet of soil sediments consisting of fill, Bay Mud, and loose to medium dense marine sands would be encountered along the northernmost cut-and-cover Caltrain segment between Folsom Street and the new terminal. The invert elevation of the subway would be below the base of the fill layer, thereby mitigating liquefaction hazards associated with the fill. However, the subway may be subjected to amplified ground motion.

The potential liquefaction hazard associated with the marine sands is considered to be minor. Moreover, since the terminal would be supported on deep foundations, the effects of liquefaction and earthquake ground motion would be minimal.

Portions of the tunnel sections of the Caltrain Downtown Extension would intersect Bay Mud along Seventh and Townsend to Fifth Street. Bay Mud extends to depths of almost 100 feet below the ground surface along this portion of the alignment. Because Bay Mud is a primary contributing factor to ground motion amplification during earthquakes, this section of the alignment is considered to be the most susceptible to amplified ground motion of any portion of the proposed project alignment. As noted above, liquefaction of fill soils should not affect the cut-and-cover subway because its invert depth lies below the base of the fill layer.

The cut-and-cover subway would encounter Bay Mud only immediately east of the Fifth Street portal. Although fill soils along the tunnel alignment are susceptible to liquefaction, the proposed subway depth should place the subway invert below the bottom of fill deposits, except at the portal.

Due to the rock formations, the alignment between Fifth and Folsom Streets would be the least affected by ground motion and should not have major ground deformation related to earthquakes, regardless of the alignment alternative.

The geologic impacts and seismic concerns discussed above are similar to those associated with numerous high-rise buildings in downtown San Francisco, and with the BART and Muni tunnels. Mitigation of these impacts *will* be accomplished through the application of geotechnical and

structural engineering principles and conventional construction techniques, similar to the design and construction of high-rise buildings and tunnels throughout the downtown area.

Consistent with current practice along other portions of the Caltrain corridor that overlie soft soils, potential settlement of the storage yard and surface tracks is best mitigated by regular maintenance of the tracks. Track repairs *will* be performed as part of Caltrain's ongoing track maintenance program.

Potential settlement of the surface and underground stations *will* be mitigated through proper design and construction of pile supported foundations for both structures. Stability of the excavations for both stations and the resultant impacts on adjacent structures can be controlled within tolerable limits by proper design and implementation of the excavation shoring systems.

Mitigation of seismic impacts on surface tracks may be handled in two ways: reinforcement or stabilization of soils beneath the tracks, or implementation of contingency plans for rapid repair of damaged rails resulting from ground shaking. Reinforcing or stabilizing soils beneath the rails is very expensive and may not guarantee that the tracks would remain operable after a strong earthquake. Consistent with current practice along other portions of the Caltrain corridor that overlie soft soils, potential impacts due to seismically induced ground motion are best mitigated by provisions for rapid rail repair. At present, these provisions include emergency communications links and work stations to expedite mobilization of personnel and equipment to damaged areas.

Structural components of the project *will* be designed and constructed to resist strong ground motions approximating the maximum anticipated earthquake (0.5g). The cut-and-cover portions would require pile supports to minimize non-seismic settlement in soft compressible sediments (Bay Mud). These supports would also serve to minimize settlement and lateral displacement resulting from seismic shaking. The underground Caltrain station at Fourth and Townsend would require pile-supported foundations due to the presence of underlying soft sediments. These foundation designs combined with seismically resistant building structures should adequately mitigate seismic impacts to the stations.

## 5.10 WATER RESOURCES

No impacts to surface or groundwater resources would result from the No-Project Alternative.

Piles underlain by Bay Mud would be used to support the Transbay Terminal and portions of the Caltrain Extension Alternatives. Although the piles could create a conduit for contaminants in shallow groundwater to migrate to deeper groundwater zones (as discussed in Section 5.21.14), the geotechnical properties of Bay Mud suggest that a tight seal will develop around the piles, minimizing downward migration of contaminated groundwater.

Stormwater along the Caltrain Extension Alternatives will discharge to the City's combined storm/sanitary sewer system. During construction, sediment transported by stormwater would not affect surface water bodies in China Basin or San Francisco Bay. For further discussion on the effects to water resources during construction, see Section 5.21.11. No mitigation measures are required for impacts to water resources.

## 5.11 FLOODPLAIN

No portions of the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project area would encounter surface water bodies, including creeks or reservoirs. Also, according to the City and County of San Francisco Planning Department, no portions of the project area lie within recognized flood hazard zones with the exception of potential tsunami inundation. No flood hazard zones have been mapped by the Federal Emergency Management Agency (FEMA) in San Francisco. Mitigation measures are not required.

## 5.12 UTILITIES

As noted in Chapter 4, the Transbay Terminal/Caltrain Downtown Extension/Redevelopment area is served by the City and County of San Francisco combined storm drain, sanitary sewer system, water supply and fire suppression system. Numerous communications systems exist in the area. The Transbay Terminal and the redevelopment would connect to these utility systems consistent with utility provider requirements.

*The Project includes the proposal to increase development in the proposed Redevelopment Area. Thus, the Project would increase the demand for and use of water and energy consumption, but not in excess of the amounts expected and provided for in the area. There would be no need for major expansion of power or water facilities due to the Project.*

*San Francisco consumers have recently experienced rising energy costs and uncertainties regarding the supply of electricity. The root causes of these conditions are under investigation and are the subject of much debate. Part of the problem is thought to be that the State does not generate sufficient energy to meet its demands and must import energy from outside sources. Another part of the problem may be the lack of cost controls as a result of deregulation. The California Energy Commission (CEC) is currently considering applications for the development of new power-generating facilities in San Francisco, the Bay Area, and elsewhere in the State. These facilities could supply additional energy to the power supply "grid" within the near future. These efforts, together with conservation, will be part of the statewide effort to achieve energy sufficiency. The Project would not be built and occupied until after 2008; therefore, additional generating facilities may have been completed by the time the Project components are utilizing electricity. The Project-generated demand for electricity would be negligible in the context of the overall demand within San Francisco and the State and would not in and of itself*

*require a major expansion of power facilities. Therefore the energy demand associated with the proposed Project would not result in a major, adverse environmental effect.*

The cut-and-cover portion of the Caltrain Extension Alternatives would require the relocation of utilities or the utilities would be supported in place along the cut-and-cover segments on Townsend, Second, Mission, and Main streets. Utilities intercepted or blocked by cut-and-cover excavation would experience the greatest potential effects. Pressure lines crossing tunnels would either be relocated out of the excavation or supported in place during construction. Gravity sewer lines would have to be rerouted around tunnels or routed over/under by siphon and/or pumping. Large consolidation sewers are especially problematic. Rerouting of these sewers would require extensive planning and coordination with the San Francisco Department of Public Works during all phases of design and construction.

Utilities crossing the alignments *will* typically be supported in place from the excavation cross-bracing. Large utility crossings (36-inch and larger) may require specially designed supporting structures. Longitudinally running utilities *will* be permanently relocated outside the excavation area or temporarily supported along the side of the excavation, then permanently relocated over the subway during street restoration.

Substantially fewer utilities would be affected by the Tunneling Option, which would be constructed below the level of utilities. A summary of anticipated utility impacts for cut-and-cover segments along the Second-to-Main and Second-to-Mission Caltrain Alternatives is provided below for the Caltrain Extension Alternatives and options.

Utility modifications will need to be evaluated in more detail during final design. Careful and continuous coordination with utility providers *will* be initiated during preliminary engineering and *will* continue through final design and construction. Utilities *will* be avoided, relocated, and/or supported as necessary during construction activities to prevent damage to utility systems and to minimize disruption and degradation of utility service to local customers. Coordination efforts *will* focus on identifying potential conflicts, planning utility reroutes, and formulating strategies for overcoming problems that may arise.

### 5.12.1 Sewer and Storm Drains

**Townsend Street from about 100 feet east of Fifth Street to Clarence Place (for both Caltrain Extension Alternatives)** – a three foot by five foot brick sewer would be affected. Cross street sewers affected include a 6.5-foot circular sewer at Fourth Street and three by five-foot brick sewer at Luck, Ritch, and Third Streets.

**Second Street from Brannan to Howard Streets (for the Cut-and-Cover Option) or from Folsom to Howard Streets (for the Tunneling Option) -- both Caltrain Extension Alternatives)** – a three by five-foot brick sewer would be affected. Cross street sewers affected include three by five-foot brick sewer at Brannan, and a three by five-foot brick sewer at Bryant,

Folsom, and Howard streets (east side of Second), and Natoma street (east side of Second Street).

**Main Street from Howard Street towards the Transbay Terminal (Second-to-Main Alternative only)** – a four by six-foot concrete sewer would be affected. Cross street sewers affected include seven-foot circular concrete sewer at Howard Street (east side of Main), a three by five-foot brick sewer at Howard Street (west side of Main), and a three by five-foot brick sewer at Folsom Street (east and west of Main Street).

**Mission Street from Beale to Main Streets (Second-to-Mission Alternative only)** – a 3.5 by 5.25-foot concrete sewer would be affected. Cross street sewers affected include a four by six-foot concrete sewer at Main Street (south of Mission) and a three-foot force main at The Embarcadero (north and south Mission Street).

### 5.12.2 Communications

Relocation of Pacific Bell's existing conduit and manhole structures, particularly underneath Second Street, would, according to Pacific Bell, require construction of duplicate structures on different paths, placing new copper and fiber optic cable, and splicing the existing cable to the replacement cable and removal of the existing cables on the existing path. Pacific Bell notes that structure construction and the cable replacements would take many years to complete, provided that new paths could be found. Pacific Bell would require specific details and an in-depth study before commenting on the feasibility of the Terminal/Extension Project as it relates to their facilities.

## 5.13 ELECTROMAGNETIC FIELDS

Although short-term human health effects from exposure to electromagnetic fields (EMFs) are well established, such as effects on the central nervous system and heating of the body, the long-term effects from EMF exposures are not clear. Several reports have proposed a link between EMF exposures and such health problems as cancer, including childhood leukemia. However, the preponderance of authoritative scientific studies has found no firm evidence of long-term health risks from low-intensity EMF exposures. Despite the lack of scientific evidence of harm, the public continues to express concern, and health and regulatory agencies continue to study the matter.

### 5.13.1 Regulatory Setting

Neither the federal government nor the State of California has set standards for EMF exposures. The Federal Drug Administration, Federal Communications Commission, Department of Defense, and Environmental Projection Agency at various times have considered guidelines. The

California Department of Education has established a policy of "prudent avoidance" for the location of schools in the vicinity of high voltage power lines. Several states and other countries have standards for electrical field exposures. The International Radiation Protection Association has proposed limiting electric field exposure to five kV/m and magnetic field exposure to 2000 mG.

### 5.13.2 Impacts

EMF effects of the Transbay Terminal / Caltrain Downtown Extension / Redevelopment Area Project pertain mainly to the implementation of electrified passenger rail service and its attendant systems in the area between the current Caltrain terminal and the proposed new terminus at the site of the present Transbay Terminal. The extension of rail service would result in new sources of EMF generation and exposure to passengers and to individuals working on commuter rail systems or passing in the vicinity of such systems. The main sources of EMF generation include overhead train power distribution systems; power substations with connecting lines to the major utility lines; passenger facilities, with their various electrical systems for lighting, communications, utilities, fare machines, among other systems, and their proximity to power distribution networks; and electrically powered locomotives or commuter rail passenger vehicles.

EMF intensities associated with trains vary considerably. The greatest potential fields, and therefore potential for exposures, are for passengers within the electric rail vehicle. Stations would also be a location of EMF exposure to passengers and any station personnel. Train operator and attendants' exposure would also be greatest in the motorized vehicle. Other worker exposure would likely be greatest when working close to an activated overhead contact system and substations.

Strong fields that carry a greater possibility of health risks are not associated with these environments, however. The field strengths of electrified rail systems are low and below recommended exposure levels. Measurements of direct current (DC) magnetic fields at substations on the San Francisco Bay Area BART system, which receives alternating current (AC) power at 34.5 kV, 60 Hertz from two parallel transmission lines, found field strengths to be small where public exposure might occur and diminishing rapidly. At the substation fence perimeter, field strengths above background ranged from 0.3 to 13.0 mG and averaged four mG, a typical exposure level of household appliances. At approximately 14 feet from the fence line, magnetic field strength was at natural background levels, or around 400-500 mG (Summary of Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement, BART-San Francisco Airport Extension), BART/U.S. Department of Transportation; SamTrans, January 1995). On-board BART trains, which contain major propulsion equipment below floor level, field strengths are higher, with measurements ranging from 1,600 to 2,000 mG total, which is four to five times the natural background level.

For Caltrain, which would be electrified at 25kV, 60 Hz AC, EMF field strengths near substations, overhead power systems, and on-board passenger vehicles would likely be less, or at least no greater, than on the BART system. In studies sponsored by the Federal Railroad Administration, measurements of average magnetic fields for overhead electrically-powered rail vehicles ranged from 400 mG at head level to 1500 mG at floor level (Safety of High speed Guided Ground Transportation Systems, EMF Exposure Environments Summary Report, Federal Railroad Administration, 1993). The duration of exposures to EMFs for Caltrain passengers and individuals passing through or by commuter rail facilities would be relatively brief in comparison to their daily exposure from office equipment, household appliances, cell phones, and other electronic equipment.

Furthermore, because the rail extension itself would be almost entirely in tunnel, the potential for non-users and businesses/residences at ground level to experience EMF exposures would be minimal. At present, the evidence is that any increased health risks from EMF exposures attributable to the project would be very small.

The potential for EMI effects from the Terminal/Extension Project can be minimized by ensuring that all electronic equipment is operated with a good electrical ground and that proper shielding is provided for electronic system cords, cables, and peripherals. Installing specialized components, such as filter, capacitors and inductors, can also reduce EMI susceptibility of certain systems. No additional restrictions or protective measures for low-intensity EMF exposures attributable to the project would be warranted.

Because EMF intensities and exposures from Caltrain operations are below thresholds indicating potential health risks, no mitigation measures are proposed.

## 5.14 HISTORIC AND CULTURAL RESOURCES

The regulatory framework governing treatment of historic and cultural resources is detailed in Section 4.16. This EIS/EIR affords the State Historic Preservation Officer (SHPO) early notice, pursuant to California PRC 5024.5(a), of a project potentially affecting resources listed in, or eligible for, the California Register of Historic Resources. *A summary of effects to historic and cultural resources is* presented herein. *A* Finding of Effects report *was* prepared and submitted to the SHPO for concurrence.

There are no impacts to historic and cultural resources as a result of the No-Project Alternative. The remainder of this section focuses on impacts of the three components of the proposed project.

### 5.14.1 Archaeological Resources: Impacts

#### 5.14.1.1 Prehistoric Archaeology

Although five prehistoric archaeological sites have been recorded within approximately one mile of the area of potential effects (APE), no known prehistoric archaeological sites are documented within the APE. Unidentified sites may exist, however, and could be affected by the implementation of any project alternative. Appropriate procedures for the treatment of such finds are identified in the mitigation section below.

#### 5.14.1.2 Historic Archaeology

Nineteen known or potential historic-era archaeological sites have been identified within or immediately adjacent to the APE.

The entire APE is covered by buildings or pavement, as well as great depths of artificial fill, and it is not possible to determine the locations of archaeological sites that may be affected by construction without extensive fieldwork. An archaeological Research Design and Treatment Plan, as described in the mitigation section, will be prepared once detailed construction plans for the proposed project are approved. This plan will govern testing, evaluation, and assessment of impacts to any such resources, and describe appropriate treatment strategies.

Areas of high historic archaeological sensitivity include the whole Transbay Terminal Redevelopment Area, the Second-to-Main Alternative alignment, and the Second-to-Mission Alternative alignment – particularly those portions that are not within areas that have long been used as roadways. Portions of the alternative alignments that pass under existing/long-standing roadways – for example Second and Townsend Streets – are generally less sensitive than areas where development has been present for many years.

### 5.14.2 Archaeological Resources Mitigation

Mitigation measures for archaeological, *historic archaeological* and historic architectural resources *are* set forth in a Memorandum of Agreement (MOA), *included as Appendix G to Volume I of this Final EIS/EIR. Signatory parties to the MOA will be FTA and SHPO. Invited concurring parties include the Transbay Joint Powers Authority (TJPA), the City and County of San Francisco, the Peninsula Corridor Joint Powers Board (JPB), and Caltrans. For mitigation measures related to historic architectural resources, please see Section 5.14.3.5.*

The MOA include*s* an Archaeological Research Design and Treatment Plan to avoid and mitigate potential impacts to archaeological resources. The plan provide*s* for organizing the various phases of archaeological work – identification, evaluation, and data recovery – into a single pre-approved plan covering the treatment of all on-site archaeological properties, and help

to avoid lengthy interruptions of construction activities. The Plan covers any additional archaeological research investigation standards and procedures, field excavation strategies, monitoring, artifact handling and analysis procedures, treatment of human remains, and ownership and curation of materials. Requirements for final reporting of all field methods, results, and findings *are* also specified. Finally, the Plan ensures that all federal and State laws and regulations regarding the treatment of Native American cultural materials and Native American burials *will* be adhered to, including appropriate notification of the California Native American Heritage Commission and local Native American organizations regarding findings of Native American artifacts.[21]

The Plan *will* be developed with the coordination and concurrence of FTA, SHPO, and the City and County of San Francisco's Environmental Review Officer (ERO) in accordance with ACHP and the Secretary of the Interior's standards and guidelines (36 CFR 800.9 (c) (1)). The various phases of work *will* be performed under the supervision of professional archaeologists who meet or exceed the Secretary of the Interior's qualification standards.

Copies of the final reports on these archaeological investigations *will* be provided to the SHPO, the Historical Resources Information System, the Northwest Information Center of California Archaeological Inventory, the San Francisco Planning Department, and the San Francisco Public Library.

If human remains are encountered during construction, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code 5097.88.

*Based on a reasonable presumption that archeological resources may be present within the project site, the following measures shall be undertaken to avoid any adverse effect from the proposed project on buried or submerged historical resources. The project sponsor shall retain the services of a qualified archeological consultant having expertise in California prehistoric and urban historical archeology. The archeological consultant shall undertake an archeological testing program as specified herein. In addition, the consultant shall be available to conduct an archeological monitoring and/or data recovery program if required pursuant to this measure. TJPA or its consultants will carry out, in consultation with the Caltrain Joint Powers Board (JPB) and the City and County of San Francisco (CCSF), the following activities regarding mitigation of potential archaeological resource impacts.*

*TJPA or its consultants will carry out, in consultation with the JPB and City and County of San Francisco, the following activities regarding mitigation of potential archaeological resource impacts.*

[21] Reference *will* be made to the Archaeological Research Design/Treatment Plan for the Embarcadero Freeway Replacement/Terminal Separator Structure Project, Holman & Associates, 1996, which covers a similar geographic area and deals with many of the same potential archaeological resources as the proposed project.

A. ***Research Design/Treatment plan development.*** *The TJPA will have a comprehensive Research Design/Treatment Plan for archeological resources prepared by a qualified consultant. The Research Design/Treatment Plan will be consistent with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into account the ACHP publication, Treatment of Archaeological Properties: A Handbook (ACHP 1980), and SHPO guidelines.*

B. ***Research Design/Treatment Plan Specifics.*** *The Research Design/Treatment Plan will include, at a minimum:*

1. ***An Historical Context for the Area of Potential Effects for Archaeological Resources (APEAR).*** *The Historical Context will present prehistoric and historic-era overviews of the project area. The Historical Context should incorporate data developed in the Archaeological Research Design and Treatment Plan for SF-480 Terminal Separation Rebuild (Praetzellis and Praetzellis, 1993) and the San Francisco-Oakland Bay Bridge, West Approach Replacement: Archaeological Research Design and Treatment Plan (Ziesing, 2000) for the portions of the APEAR within the scope of these documents.*

2. ***A Research Context for the APEAR.*** *The Research Context will identify expected archeological property types and develop research themes, questions, and data needs. To the extent applicable to expected property types, the Research Context will incorporate the research framework developed in the Revised Historical Archaeology Research Design for the Central Freeway Replacement Project (Thad M. Van Bueren, Mary Praetzellis, Adrian Praetzellis, Frank Lortie, Brian Ramos, Meg Scantlebury and Judy D. Tordoff).*

3. ***Testing/Data Recovery Plan*** *that will specify, at minimum:*

- *The properties or portion of properties where evaluation and/or data recovery are to be carried out;*
- *The properties, if any, that will be affected by the Undertaking but for which no data recovery will be carried out;*
- *The manner in which inadvertent discoveries will be treated;*
- *The methods to be used for data recovery, with an explanation of their relevance to the research questions/themes;*
- *The methods to be used in cataloguing, analysis, data management, and dissemination of data;*

- *The proposed disposition of recovered materials and records, including discard and deaccession;*
- *The manner in which any human remains and associated/unassociated funerary objects, including those of Native American or Native Hawaiian origin, will be treated;*
- *The security procedures to be undertaken to protect the archeological testing/data recovery site from vandalism, theft, or unintended damage;*
- *The final report summarizing, describing and interpreting the results of testing/data recovery;*
- *The measures to be undertaken to ensure curation of recovered data determined to have appropriate research potential.*
- *Research Design/Treatment Plan Review*

*TJPA will submit the Research Design/Treatment Plan to all parties signing the MOA for a thirty (30) calendar day review following receipt of the Plan. If any party fails to submit their comments within thirty (30) days, TJPA may assume that party's concurrence with the Research Design/Treatment Plan. TJPA will take any review comments into account, revise the Research Design/Treatment Plan accordingly, and will notify any party whose comments were not incorporated into the Plan.*

C. ***Notification.*** *TJPA will promptly notify the SHPO, FTA, and Caltrans, as appropriate, if any properties are found that meet the conditions for eligibility for inclusion in the NRHP.*

D. ***Report Standards and Dissemination.*** *TJPA will ensure that all reports from implementation of the Research Design/Treatment Plan meet contemporary professional standards and the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37). Copies of all final reports will be provided to the SHPO, the Northwest Information Center at Sonoma State University, the Federal Transit Administration, Caltrans, and the Environmental Review Officer of the CCSF.*

E. ***Confidentiality.*** *Historic properties covered by this Agreement are subject to the provisions of § 304 of the National Historic Preservation Act of 1966 and § 6254.10 of the California Government Code (Public Records Act), relating to the disclosure of archeological site information and, having so acknowledged, will ensure that all actions and documentation are consistent with § 304 of the National Historic Preservation Act of 1966 and § 6254.10 of the California Government Code.*

F. ***Annual Report.*** *TJPA will prepare an annual report describing the status of its efforts. The annual report will be prepared following the end of the each fiscal year (July 1 to June 30) until TJPA determines that the applicable mitigation measures regarding archaeology have been completed.*

### 5.14.3 Historic Architectural Resources: Impacts

Historic architectural resources identified within the project APE consist of individual buildings and structures, some of which are contributors to two districts that are eligible or appear to be eligible for the National Register of Historic Places (NRHP). These are the Rincon Point / South Beach Historic Warehouse-Industrial District and the Second and Howard Streets Historic District. Both NRHP districts have boundaries somewhat overlapping two local historic districts designated by the City of San Francisco, the South End Historic District, and the New Montgomery – Second Street Conservation District. *Properties listed on* or determined eligible for listing on the NRHP, either individually or as contributors to an historic district, are identified in Table 4.16-1. The NRHP and City of San Francisco historic districts are described in Sections 4.16.6.3 through 4.16.6.7.

Impacts to historical architectural resources are reported by major project component; impacts to *individual properties* are presented first, followed by impacts to *contributing elements* of the NRHP and local historic districts.

#### *5.14.3.1 Impacts of Transbay Terminal Alternatives*

*Either Transbay Terminal alternative would require demolition and removal of the existing Transbay Terminal, a property that is listed on the National Register as a contributing element to the San Francisco-Oakland Bay Bridge. The bridge is a multi-component property that was listed on the NRHP on August 13, 2001. Both Transbay Terminal alternatives would also require demolition and removal of the existing Terminal Loop Ramp structures, which are also contributing elements of the Bay Bridge property. The demolition of these structures would constitute an adverse effect under Section 106 and under the California Environmental Quality Act (CEQA).*

*The San Francisco-Oakland Bay Bridge East Span Seismic Safety Project, currently under construction, will eliminate the East Span, one of the major elements included in the NRHP listing for the entire Bridge. After completion of both the Transbay Terminal/Caltrain Downtown Extension/ Redevelopment Project, and the East Span Seismic Project (a construction project already underway), two major elements of the current bridge – namely the West Span bridge structures and the Yerba Buena Tunnel – would remain. It is anticipated that these remaining structures and buildings would continue to be eligible for the NRHP.*[22] *This is based upon the definition of "historic district" and "historic structure" presented in National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation (1990 and 2002). "A district possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development," and "the term 'structure' is used to distinguish from buildings those functional construction made*

22 *Letter from Meta Bunse, JRP Consulting to David Mansen, Parsons, March 12, 2004.*

*usually for purposes other than creating human shelter." Certainly they are important for their technological and engineering achievements. If reevaluation of the bridge property indicates that it would be more appropriate for the remaining structures to be listed on the National Register as individual properties, it is anticipate that these remaining structures would continue to appear to be eligible and would merit individual listing. The MOA (Appendix G of this Final EIS/EIR) includes a provision (III.E) for the revaluation of the remaining bridge components following completion of the Project.*

*In accordance with California Public Resources Code Section 5027, the Transbay Terminal and terminal loop ramp, as NRHP-eligible structures that would be transferred from state (Caltrans) ownership to another public agency (the Transbay Joint Powers Authority) may not be demolished without the prior approval of the California Legislature. The California Legislature has considered the importance of proceeding with the Transbay Transit Terminal project and has granted a specific exemption to State Law prohibiting the demolition of historic structures with the following language: "the Legislature hereby approves demolition of the Transbay Terminal building at First and Mission Streets in the City and County of San Francisco, including its associated ramps, for construction of a new terminal at the same location, designed to serve Caltrain in addition to local, regional, and intercity bus lines, and designed to accommodate high-speed passenger rail service." (AB 812, 2003)*

### 5.14.3.2 Impacts of Caltrain Downtown Extension Alternatives

Either Caltrain Downtown Extension alternative would result in the acquisition and demolition of buildings that *are individually eligible or that are contributing elements of* a district that is eligible for listing in the NRHP.

**The Cut-and-Cover Option** for either the Second-to-Main Alternative or the Second-to-Mission Alternative would result in the demolition of 13 historic buildings, 10 of which are contributors to the Rincon Point / South Beach Historic Warehouse-Industrial District, and three of which are contributors to the Second and Howard Streets Historic District. These demolitions would constitute *an adverse effect under Section 106 and under CEQA. The demolition of the three buildings in the Second and Howard Streets Historic District would also result in an adverse effect by isolating three other contributory buildings from the remainder of the district.*

A construction easement through the corner of the *parcel* occupied by a fourteenth *contributing* property of the Rincon Point/South Beach Historic Warehouse-Industrial District would also be required. The construction easement would be necessary to construct the Caltrain subway beneath the southeast corner of the building at 166-78 Townsend Street. The building would be underpinned during construction and maintained in place. There would be no adverse effect to this building from the construction easement.

**The Tunneling Option** for either the Second-to-Main or Second-to-Mission Alternative would substantially reduce the impacts to historic resources. This Option would result in the demolition of three historic buildings that *are contributing elements of* the Second and Howard Streets Historic District but would *not have an adverse effect on* the buildings within the Rincon Point / South Beach Historic District. The buildings that would be demolished under the Tunneling Option are the same three contributors to the Second and Howard Streets District that would be demolished under the Cut-and-Cover Option. The demolitions would constitute *an adverse effect under Section 106 and under CEQA. The demolition of these three buildings would also result in an adverse effect by isolating three other contributory buildings from the remainder of the district.*

A construction easement through the southeast corner of the *parcel* occupied by the building at 166-78 Townsend Street, which is a *contributing element* to the Rincon Point/South Beach Historic Warehouse-Industrial District, would also be required, *as for the Cut-And-Cover Option.* There would be no adverse effect to this building from the construction easement. The building would be underpinned during construction and maintained in place.

### 5.14.3.3 Redevelopment Components

Neither of the redevelopment component alternatives (Full Build or Reduced Scope) would result in an adverse effect to historic properties.

### 5.14.3.4 Affected Properties

Brief descriptions of the historic properties that would be affected by the project are provided in the following paragraphs and accompanying figures. *Individually listed NRHP properties* are described first, followed by the *districts and their contributing elements.* The effects on the NRHP and locally designated districts are then discussed. The NRHP and City of San Francisco historic districts are described in detail in Sections 4.16.6.3 through 4.16.6.7.

**Transbay Terminal.** The Transbay Terminal at 425 Mission Street occupies land extending from Mission Street on the north to Natoma Street on the south; the terminal building crosses Fremont Street on the east and First Street on the west. It was designed by Timothy Pfleuger, Arthur Brown, Jr., and John J. Donovan,

consulting architects. Built in 1939, the Transbay Terminal was the "functional successor to the Ferry Building. When electric trains began arriving over the Bay Bridge, use of the Ferry Building dropped to almost nothing overnight, and the Transbay Terminal took over as the primary gateway to the city." (Caltrans, 1983). *The Terminal is a contributing element of the San Francisco-Oakland Bay Bridge property, which was listed on the NRHP on August 13, 2001.* The present owner of the Transbay Terminal is Caltrans. Its current use is for commuter and inter- and intra-regional bus transportation.

**Transbay Terminal Loop Ramp.** The Transbay Terminal loop ramp structure constitutes two of the six approach spans that remain from the original SFOBB project. *The Terminal Loop ramp structures are contributing elements of the San Francisco-Oakland Bay Bridge property, which was listed on the NRHP on August 13, 2001.* Originally designed to carry trolley trains from the bridge to the terminal, the ramp's tracks were removed as electrified trains gave way to buses in the late 1950s. The terminal loop ramp currently serves bus traffic exclusively and is used for midday storage of transit buses.

**San Francisco – Oakland Bay Bridge.** The San Francisco – Oakland Bay Bridge (SFOBB) is an eight and one-half-mile-long series of connecting structures carrying two levels of traffic between San Francisco and Oakland. Opened to service in 1936, in its original design, the bridge upper level carried two-way auto traffic while the lower level carried truck and trolley traffic. Structurally, the bridge is distinctive in its use of a variety of bridge-building technologies, the length of its 1,400-foot cantilever channel span on the east (Oakland) side, and the length of the two 2,320-foot suuspension spans on the west (San Francisco) side. The outstanding engineering feature is the center pier between the two suspension spans of the western half of the bridge. The tunnel connection between the east and west spans on Yerba Buena Island was the first double-decked highway tunnel in the United States. Notable individuals connected wth the project were Charles H. Purcell, Chief Engineer; Charles E. Andrew, Bridge Engineer; Glenn B. Woodruff, Design Engineer; and T. L. Pfleuger, Arthur Brown, Jr., and John J. Donovan, consulting architects. *The San Francisco-Oakland Bay Bridge is a multi-component property that was listed on the NRHP on August 13, 2001.*

**Rincon Point / South Beach Historic Warehouse-Industrial District.** The Rincon Point / South Beach Historic Warehouse-Industrial District *appears to be eligible for the NRHP.* It was developed beginning in the 1850s and 1860s, when landfill efforts and warehouse construction changed the physical appearance of the "point" and "beach" forever. This district contains the

greatest concentration of *historic architectural* resources within the project vicinity. The district was identifed as appearing eligible for the NRHP in 1983, based on research completed by Caltrans historians for the I-280 Transfer Concept Project. That research found that the district appeared eligible under all four National Register criteria. About 60 buildings within the district have been identified as contributing to the district's significance. Approximately eight of these buildings date from before the 1906 San Francisco earthquake, with several from the mid-1800s.

The Rincon Point / South Beach Historic Warehouse Industrial District has also been designated locally significant and is eligible for listing in the California Register of Historic Places.

In 1985, the San Francisco Department of City Planning (DCP) proposed the "South End Historic District," and the City Planning Commission designated this district in February 1990 under Article 10, Historic Preservation. The South End Historic District had nearly identical boundaries and was nearly the same size as the Rincon Point District identified by Caltrans; it is described in detail in Section 4.16.6,7. The National Register status of *these resources*, whether recognized as part of the South End District or Rincon Point / South Beach District is the *same: they appear to be eligible for listing.* For purposes of CEQA, these properties are historic resources.

**Second and Howard Streets Historic District.** Ann Bloomfield prepared a National Register of Historic Places nomination for the Second and Howard Streets District in 1998. This small district consists of 19 contributing *elements* and three non-contributors (two heavily-altered buildings and a vacant lot) with addresses on Second, Howard, Natoma and New Montgomery Streets. The contributing buildings date from 1906 to 1912; the primary original uses of these buildings were wholesaling, light manufacturing, and printing. The area was built for services to the construction industry. The permit for the first building to be erected in the District was approved on July 5, 1906, just two and a half months following the 1906 earthquake and fire.

The Second and Howard Streets Historic District is partially surrounded by a locally recognized district known as the "New Montgomery – Second Street Conservation District." This district is described in detail in Section 4.16.6.5. The San Francisco Planning Commission uses the conservation district designation to recognize parts of the city that have substantial concentrations of "special architectural and aesthetic importance." For purposes of CEQA, these properties are historic resources.

*The following are individually eligible properties, or are contributing elements of an historic district that would be adversely affected under one or both of the project options.*

**130 Townsend Street**

A one-story warehouse of brick masonry construction, this property lies within the boundaries of the Rincon Point / South Beach Historic Warehouse - Industrial District and is a contributor to the district. The Caltrans 1983 survey dated this building ca. 1910, but information obtained for the 1996 survey from the San Francisco Architectural Heritage (SFAH) indicated that the building appears to have been built in 1895 or 1896 and was first occupied by Stevens, Arnold and Co., agents for Inglenook Vineyard of Napa County. By 1906, the property was owned by Gustave Niebaum of the Alaska Commercial Company. Under the name B. Arnhold Company, the original tenants remained until the 1920s.

**136 Townsend Street**

This two-story and clerestory industrial building was dated 1902 by the Caltrans 1983 survey, but information obtained from SFAH for the 1996 survey suggested that it was designed in 1913 by engineer R.V. Woods for L.A. Norris of the Clinton Fireproofing Company and was originally used for wire and iron storage. The building was twice its current width, but in 1922, the southern half was replaced with the more substantial structure at 144 Townsend Street for the same company. It lies within the Rincon Point / South Beach Historic Warehouse Industrial District, to which it is a contributing element.

### 144-46 Townsend Street

This three-story reinforced concrete warehouse with decorated façade was designed and built in 1922 by architect H.C. Bauman for the Clinton Construction Company (L.A. Norris, owner); it was originally used for storage of wholesale wire. This building is within the Rincon Point / South Beach Historic Warehouse Industrial District and is a contributing element to the district.

### 148-154 Townsend Street

This building is within the Rincon Point / South Beach Historic Warehouse Industrial District and is a contributing element to the district. A three-story, reinforced concrete warehouse in the Mediterranean style, it was designed by H.C. Bauman and Edward Jose in 1922 for the Winchester-Simmons Company, wholesale dealers in hardware, guns, and ammunition. By 1950, the building was occupied by Western Asbestos Company.

### 162-164 Townsend Street

This building was designed by H.C. Bauman for the L.A. Norris Company and was built by the Clinton Construction Company in 1919. By 1929, it was occupied by the Central Warehouse and Drayage Company. Work being done on the building during the 1996 survey included removal of the sign for West Coast Ship Chandlers at the front. This building is within the Rincon Point / South Beach Historic Warehouse Industrial District and is a contributing element to the district.

### 166-168 Townsend Street

This distinctive building was dated 1910 by Caltrans in 1983, but information obtained from SFAH for the 1996 survey suggests that it was designed by Percy and Hamilton in 1888 for the California Electric Light Company, which may have been the first public electric power company in the state; it first generated electricity for the public in 1879.

On August 1, 1888, the company was awarded the contract for lighting outlying districts of San Francisco, and this building may have been built to address the need for extra capacity. By 1894, ownership was held by the Edison Light & Power Company and by 1901, it had passed to the San Francisco Gas and Electric Company, which made it their Arc Light Plant Station B. By December of 1905, this building was no longer in operation for electricity service, probably because a new plant was built across Townsend Street.

From 1908 to 1927, the building was used for hay and grain storage and as a feed mill (W.W. Robinson Co., 1908-1910 and Producers Hay Co., 1913-1927). The high stack at the rear of the building was removed in 1995, following damage in the 1989 Loma Prieta earthquake. This alteration would affect its potential for individual eligibility, but the rest of the large building remains, and it remains a contributor to the Rincon Point/South Beach Historic Warehouse District.

**640 Second Street**

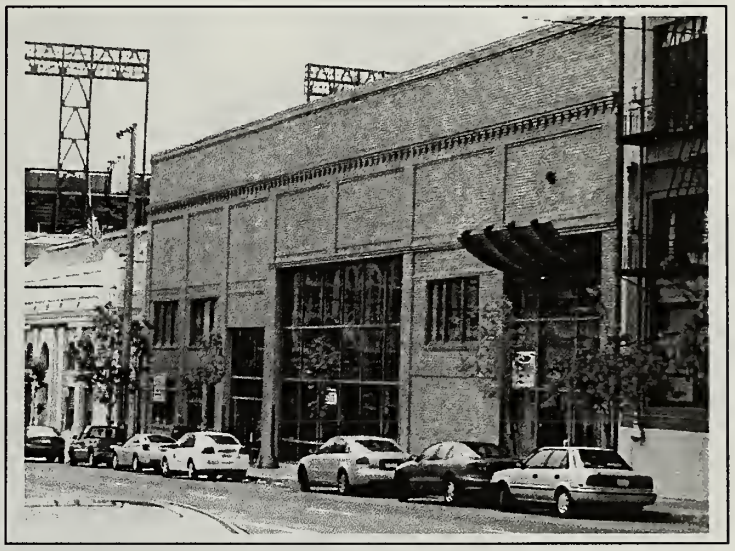
Another Bauman design for L.A. Norris, this building lies within the Rincon Point / South Beach Historic Warehouse Industrial District and is a contributing element to the district. It was built in 1925-26 and was first occupied by the United States Radiator Corporation.

**650 Second Street**

This building is within the Rincon Point / South Beach Historic Warehouse Industrial District and is a contributing element to the district. A six-story reinforced concrete office and warehouse with a Spanish tiled parapet, this building was designed in 1922 by Baumann (sic) and Jose, architects for J. Sheldon Potter, capitalist. It was occupied by B.F. Goodrich Rubber Company until 1934, when it was altered inside for use as a bottling plant.

### 670-680 Second Street

This building was designed in 1913 by Leland S. Rosner, engineer, for Moore and Scott Iron Works as a castings, forging, machine shop, and boiler works. The company was an important ship builder during World War I under the name, Moore Shipbuilding & Dock Company. The building is within the Rincon Point / South Beach Historic Warehouse Industrial District and is a contributing element to the district.



### 301-321 Brannan Street

This building was determined individually eligible for the NRHP by Caltrans in 1982. It also lies within the Rincon Point / South Beach Historic Warehouse Industrial District and is a contributing element to the district. It was designed by architect Lewis P. Hobart and built in 1909 as the west coast headquarters of an eastern pipe and plumbing supply company, the Crane Company.

### 165-173 Second Street

This six-story, brick clad Electric Building was designed in 1906 by John Cotter Pelton. In 1910, it was being used by the Westinghouse Electric Company. It lies within the Second and Howard Historic District and is a contributing element to the district.

### 191-197 Second Street

This four-story, brick clad building was designed in 1907 by Ross & Burgen. In 1910, it was being used for wholesaling by the American Chicle Company, Badische Company (chemicals) and Jesse Moore Hunt Company (liquor wholesaling). It lies within the Second and Howard Historic District and is a contributing element to the district.

**580-586 Howard Street**

The first building to go up in the Second and Howard Historic District, this four-story, brick clad building was designed in 1906 by A. W. Smith and constructed by the R.W. Kinney Company for its own business, plumbing supplies. The building permit was approved July 5, 1906, only two and a half months after the 1906 earthquake and fire. This use may have sparked the whole District's specialization in construction services. In 1910 the building was still being used for plumbing supplies wholesaling as well as printing. It lies within the Second and Howard Historic District and is a contributing element to the district.

*Project effects on these individually eligible properties and the districts to which they are contributing elements are summarized in Table 5.14-1 and described in the following paragraphs.*

**New Montgomery-Second Street Conservation District (City of San Francisco) and Second and Howard Streets District (National Register of Historic Places).** Many of the buildings in this area are located within two overlapping districts of historic buildings, one designated by the City of San Francisco, the New Montgomery-Second Street Conservation District, hereafter "Conservation District," and the other certified by the Keeper of the National Register, the Second and Howard Streets District, hereafter "National Register District." Both proposed Caltrain Downtown Extension alternatives (Second-to-Main and Second-to-Mission) would involve demolition of three buildings located near the intersection of Second and Howard Streets in San Francisco. These impacts would occur under either the Cut-and-Cover Option or the Tunneling Option. *The Tunneling Option has been identified for this component of the Locally Preferred Alternative.*

The three buildings within the Historic Architectural APE for this project that would be demolished under the Caltrain Downtown Extension alternatives are listed below and shown in the following photographs:

**580-*586* Howard Street,**
**APN: *3721-092 through 3721-106***

***165-173* Second Street,**
**APN: 3721-025**

**191 Second Street,**
**APN: 3721-022**

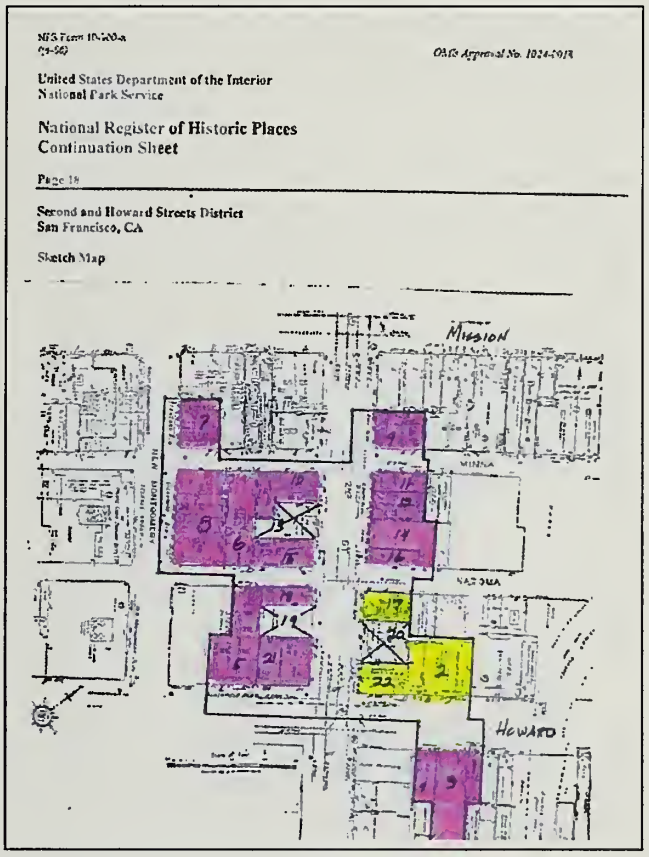
**View of buildings at corner of Second and Howard**

The two Second Street buildings are located within the Conservation District. All three buildings are contributing elements of the National Register District. The demolition of these buildings would be an adverse effect to each individual building and to the National Register District to which they contribute. Because the term "adverse effect" applies only to *properties* that are eligible for and/or that are listed on the National Register, there is technically no "adverse effect" to the Conservation District. As both buildings in the Conservation District would be historic resources according to CEQA Guidelines Section 15064; however, the demolition of these buildings would be a substantial adverse change under CEQA.

**View of 171 Second Street**
*165-173* Second Street is brick building on the left.
191 Second Street is building on the right).

The Conservation District covers a much larger area than the National Register District, so the quantitative effect of demolishing these buildings is less for the Conservation District than for the National Register District. The Conservation District would lose two of approximately 53 parcels located within its boundaries, while the National Register District would lose three of its total of 19 contributing buildings. Affected buildings make up less than four percent of the Conservation District, while the demolished buildings make up over 15 percent of the National Register District. *Nonetheless*, loss of the two buildings would constitute a substantial adverse effect to the Conservation District under CEQA, given that the loss could have an effect on the overall integrity of the district.

Another expected adverse effect to the National Register District would be the possible alteration of the district boundaries. The loss of the three buildings of the National Register District would create a wide gap that would separate the south-easternmost contributors (577-79, 583-87, and 589-591 Howard Street) from the rest of the district. None of these Howard Street properties is being proposed for demolition, but all would be adversely affected by the demolition of the *contributing elements* listed above because they would become isolated from the larger, more cohesive group. *The building at 163 Second Street would also experience an adverse effect due to the loss of a nearby contributing building. It does not appear that this loss would cause 163 Second Street to experience a change in status and it would continue to be eligible as a contributing element of the district.*[23]




In summary, each of the individual buildings proposed for demolition in this part of the project would be adversely affected by either Caltrain Downtown Extension alternative. Although both districts would lose buildings that exist within their boundaries, only those that contribute to the National Register District would be "adversely affected." Furthermore, the National Register District itself would be adversely affected through the loss of three contributing

**577-79, 583-87, and 589 Howard Street**

23 *Letter from Meta Bunse, JRP Consulting to David Mansen, Parsons, March 12, 2004.*

buildings, and by the fact that *three* additional buildings (not scheduled for demolition) would become more isolated from the rest of the contributors. The cumulative effects are not expected to result in a de-listing of the National Register District, nor would it necessarily result in rescission of the Conservation District.

*It is anticipated that the adverse effect of demolishing these three buildings would not require a change in the NRHP status of the district. According to the NRHP, "a district derives its importance from being a unified entity, even though it is often composed of a wide variety of resources," and explains further that the interrelationship of the contributing elements of the district "can convey a visual sense of the overall historic environment or be an arrangement of historically or functionally related properties."[24] The district currently contains 19 contributing buildings, so the demolitions associated with the Project would leave 16 elements. Of the 16, three buildings (discussed below) would be isolated from the remaining district leaving 13 contributing buildings after implementation of the Project. These 13 buildings are expected to retain the strong visual linkage that helps to define the buildings as a district. It is anticipated that the portion of the district formed by the 13 contributing elements that would remain after completion of the Undertaking would retain this important linkage and together would continue to be eligible as a historic district.[25] The MOA (Appendix G of this Final EIS/EIR) includes a provision (IV.D) for the revaluation of the District following completion of the Project.*

*Three contributing elements of the Second and Howard Streets District would be adversely affected by demolition of nearby contributing buildings thus impairing their linkage with the remaining contributing elements of the district. These buildings are: 589-591 Howard Street, San Francisco (HPSR Map Reference #28); 579 Howard Street, San Francisco (outside of APE); and 583-587 Howard Street, San Francisco (outside of APE). It appears that the demolition of nearby contributing elements discussed above would impair the linkage between these three buildings on Howard Street and the remainder of the district. The reevaluation of these properties after completion of the Project would determine whether or not they should be removed from the district listing and whether or not they are individually eligible for the National Register.*

Both districts would retain numerous contributing buildings and each would still display the elements that define the character and nature of each district. It is important to note, however, that the piecemeal demolition of additional contributing *elements* would have a cumulative adverse effect on the National Register District. Additional demolitions could lead to de-listing of the district, especially if the district had already suffered previous losses of contributing buildings. Demolition of the two buildings within the boundaries of the Conservation District, on the other hand, must be approved via the processes set forth in Article 11 of the City of San Francisco Planning Code.

24 NPS, NRHP, *National Register Bulletin 15*, 5.
25 *Letter from Meta Bunse, JRP Consulting, to David Mansen, Parsons, March 12, 2004.*

**The South End Historic District (City of San Francisco) and the Rincon Point/South Beach Historic Warehouse-Industrial District (Eligible for National Register of Historic Places).** Both Caltrain Downtown Extension alternatives (Second-to-Main and Second-to-Mission) would involve demolition of ten buildings located near the intersection of Second and Townsend Streets, if the Cut-and-Cover Option is selected. Under the Tunneling Option, *which has been identified for the Caltrain Downtown Extension component of the Locally Preferred Alternative,* these impacts would not occur. Many buildings in this area are located within two overlapping districts of historic buildings, one designated by the City of San Francisco, the South End Historic District, hereafter "Historic District," and the other a National Register eligible district called the Rincon Point/South Beach Historic Warehouse-Industrial District, hereafter "National Register District."[26]

The ten buildings within the Historic Architectural APE for this project that would be demolished under the cut-and-cover alternative are listed below and shown in the photographs that follow:

| Address | APN |
|---|---|
| *162*-164 Townsend Street | *3788-081* |
| 148-154 Townsend Street | 3788-010 |
| 144-146 Townsend Street | 3788-009A |
| 136 Townsend Street | 3788-009 |
| 130 Townsend Street | 3788-008 |
| 670-680 Second Street | 3788-043 & 044 |
| 650 Second Street | 3788-049 *through 3788-073* |
| 640 Second Street | 3788-002 |
| 634 Second Street | 3788-038 |
| 301 Brannan Street | 3788-037 |

The demolition of these buildings *would* cause adverse effects to each individual building. The *contributing elements* listed above *are located* within the boundaries for both the National Register District and the *locally-designated* Historic District. The demolition of these buildings would be an adverse effect to the National Register District to which they contribute. Because the term "adverse effect" applies only to *properties* that are eligible for and/or that are listed on the National Register, there is technically no "adverse effect" to the local Historic District designated by the City of San Francisco. As these buildings are *contributing* to and in the Historic District, they are historic resources according to CEQA Guidelines 15064.5 nonetheless, and demolition of these buildings would be a substantial adverse change under CEQA.

[26] This district has been fully documented and appears to be eligible for the National Register. Although it is not yet listed on the National Register, it has been submitted to the Office of Historic Preservation and is considered eligible for the National Register for the purposes of Section 106 review.

The quantitative effect of demolishing these buildings is roughly equivalent for the two districts because the Historic District would lose ten of the approximately 60 buildings within its boundaries, while the National Register District would lose ten of its total of 60 contributing buildings. (While these counts are similar, the boundaries of the two districts are not identical.) Affected buildings represent about one sixth of the buildings within each district.

**View looking east on Townsend toward intersection with Second Street.**

Another expected adverse effect to the National Register District would be the possible alteration of the district boundaries. The loss of the ten buildings of the National Register District would be a substantial adverse effect to two streetscapes within the district: one on the northwest side of the 100 block of Townsend and the other on the southwest side of the 600 block of Second Street. The loss of these ten buildings would create a gap that would break up the continuity of the center of the district in a city block that includes a high percentage of contributing buildings. The National Register District currently contains three blocks of streetscapes with contributing buildings lining both sides of the street. If these buildings were removed, only the 500 block of Second Street would retain buildings along both sides.

**View looking north on Second Street from intersection of Townsend and Second.**

Building at left is 698 Second Street. It would not be demolished, although the buildings to the north up to Brannan Street would be demolished under the cut-and-cover option.

The demolition of the two rows of buildings would also have an adverse effect on 698 Second Street, an important contributor to the National Register District. This building was built in 1910 as San Francisco Fire Department Pumping Station Number One and it was separately listed on the National Register of Historic Places in 1982. While this building is outside the APE for this project, and not proposed for demolition, it would be adversely affected by the demolition of buildings on either side of its corner location. An additional portion of the National Register

District would be largely separated from the rest of the district by the proposed demolitions. The contributing buildings along Third Street and those buildings on Townsend and Brannan Streets that are near Third Street would be isolated from the larger, more cohesive group. The loss of the ten buildings at the center of the district would substantially impair its visual continuity and the district's ability to impart a sense of time and place. The City's Historic District boundary may also need to be changed to reflect the loss of the same ten buildings on Townsend and Second Streets.

In summary, each of the ten individual buildings proposed for demolition in this part of the project would be adversely affected by the Cut-and-Cover Option under either Caltrain Downtown Extension alternative. Although both districts would lose buildings that exist within their boundaries, only those that contribute to the National Register District would be "adversely affected." The National Register District would not only be adversely affected through the loss of contributing buildings, it would also have the result that entire rows of adjacent contributors that form two sides of important streetscapes within the district would be demolished. Additionally, a contributor to the district that is already listed on the National Register (698 Second Street) would be adversely affected through its isolation from its existing historic streetscape. These cumulative effects may result in a de-listing of the National Register District. It would also have serious implications in terms of the integrity of the Historic District for the same reason. *Because the Tunneling Option has been identified for the Caltrain Downtown Extension component of the Locally Preferred Alternative (LPA), these effects of the Cut-and-Cover Alternative would not occur under the LPA..*

Table 5.14.1 lists the affected properties with the assessor's parcel number, NRHP status, and type of impact for each. The table also groups the properties according to their respective district.

**Table 5.14-1: Summary of Project Effects on Listed or Eligible Properties in APE**

| Address/ Assessors Parcel Number | NRHP Status | Contributing *Element of* | City Status | Const. Date | Type of Impact |
|---|---|---|---|---|---|
| **Properties Affected by Either Transbay Terminal Alternative** | | | | | |
| 425 Mission Street (Transbay Terminal) / 3719-003,3720-001,3721-006 | *1* | S.F-Oakland Bay Bridge | | *1936* | Demolition |
| Bay Bridge Approach / *#34-116F* | *1* | S.F-Oakland Bay Bridge | | *1936* | Demolition |
| Bay Bridge Approach / *#34-118L* | *1* | S.F-Oakland Bay Bridge | | *1936* | Demolition |
| *Bay Bridge Approach / #34-118R* | *1* | S.F-Oakland Bay Bridge | | *1936* | Demolition |
| *Terminal Loop Ramps / #34-119Y* | *1* | S.F-Oakland Bay Bridge | | *1936* | Demolition |
| *Harrison Street Overcrossing / #34-120Y* | *1* | S.F-Oakland Bay Bridge | | *1936* | Demolition |

**Table 5.14-1: Summary of Project Effects on Listed or Eligible Properties in APE**

| Address/ Assessors Parcel Number | NRHP Status | Contributing *Element of* | City Status | Const. Date | Type of Impact |
|---|---|---|---|---|---|
| **Properties Affected by Either Caltrain Downtown Extension Alternative Either Construction Option (Cut-and-Cover and Tunneling Options)[27]** | | | | | |
| **Address/ Assessors Parcel Number** | **NRHP Status** | **Contributing *Element of*** | **City Status** | **Const. Date** | **Type of Impact** |
| *589-591 Howard Street / 3736-098* | *1D* | Second & Howard District & New Montgomery/ Second Street | Article 11 Category V | *1906* | *Adverse effect to linkage with district* |
| *163 Second Street / 3721-048* | *1D* | | | *1907* | *Adverse effect due to loss of nearby contributing building* |
| 165-173 Second Street / 3721-025 | 1D | | | 1906 | Demolition |
| 191 Second Street / 3721-022 | 1D | | | 1907 | Demolition |
| 580-586 Howard Street / *3721-092 through 3721-106* | 1D | Second and Howard District | | 1906 | Demolition |
| *166-78 Townsend Street / 3788-012* | *3D* | *Rincon Point/South Beach District & South End District.* | | *1910 [1] 1888[2]* | *Construction easement; no demolition; no adverse effect* |
| **Properties Affected by Either Caltrain Downtown Extension Alternative Cut-and-Cover Option Only** | | | | | |
| 640 Second Street / 3788-002 | *2S2* | Rincon Point/South Beach District & South End District. | Article 10 Contributing | *1926* | Demolition |
| 650 Second Street / 3788-049 *through 3788-073* | *2S2* | | | 1922 | Demolition |
| 670-680 Second Street / 3788-043, 3788-044 | *2S2 (670), 3D (680)* | | | 1913 | Demolition |
| 301-321 Brannan Street / 3788-037 | 3D | | | 1909 | Demolition |
| 130 Townsend Street / 3788-008 | 3D | | Article 10 Contributing Altered | 1910 [1] 1895-6 [2] | Demolition |
| 136 Townsend Street / 3788-009 | 3D | | Article 10 Contributing | 1902 [1] 1913 [2] | Demolition |
| 144-46 Townsend Street / 3788-009A | 3D | | | 1922 | Demolition |
| 148-54 Townsend Street / 3788-010 | 3D | | | 1922 | Demolition |
| 162-164 Townsend Street / 3788-*081* | 3D | | | 1919 | Demolition |

**Notes:** National Register Status Codes are as follows:
*1* *Listed on the NRHP*
2S1 Determined eligible for listing by the Keeper of the Register
2S2 Determined eligible for listing by consensus of the SHPO and a federal agency.
1D Listed on National Register as a contributor to a district or multi-resource property
2D2 Determined eligible as a contributor by consensus determination
3D Appears eligible as a contributor to a fully documented district
[1] Caltrans, 1983, [2] Corbett and Bradley, 1996 **Source:** JRP Historical Consulting, Parsons Transportation Group, 2001.

[27] *The buildings at 577-79 Howard Street (built in 1907, parcel 3736-100) and 583-87 Howard Street (built in 1912, parcel 3736-099), which are outside the APE but are contributing elements to the National Register District, would also experience a substantial adverse change to their linkage with the remainder of the district.*

### *5.14.3.5 Potential Mitigation Measures for Historic Architectural Resources*

Mitigation measures *are* set forth in a Memorandum of Agreement (MOA – Appendix G of Volume I in this Final EIS/EIR). *Signatory parties to the MOA will be FTA and SHPO. Invited concurring parties include the Transbay Joint Powers Authority (TJPA), the City and County of San Francisco, the Peninsula Corridor Joint Powers Board (JPB), the San Francisco Redevelopment Agency, and Caltrans.* They include measures as discussed below.

- ***Documentation.*** Because it is unlikely that relocation of historic *properties* will be feasible, recordation *will occur* to ensure a permanent record of the properties' present appearance and context. Under this mitigation, *prior to the start of any work that would have an adverse effect on historic properties, TJPA will consult with the California SHPO, to ensure that the Transbay Transit Terminal has been adequately recorded by past efforts. Collectively, these past studies, which include California Department of Transportation's (Department's) past recordation of a series of remodeling and seismic retrofit projects that have occurred since 1993, may adequately document the building, making Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) documentation unnecessary. In addition, TJPA, assisted by Department, will seek to obtain the original drawings of the Transbay Transit Terminal by the architect Timothy Pflueger. If the drawings cannot be copied and included in the documentation, then TJPA will consult with SHPO regarding recordation level and specifications for completing additional documentation. When the SHPO finds the documentation to be adequate, then TJPA will compile this documentation into a comprehensive record. All documentation will be submitted to SHPO and Department Headquarters Library with a xerographic copy to the Department District 4 Office. TJPA will contact the following repositories to inquire if they would like to receive a xerographic copy of the documentation: History Center at the San Francisco Public Library, San Francisco Architectural Heritage, the Oakland History Room of the Oakland Public Library, the Oakland Museum of California, and the Western Railway Museum. TJPA will ensure that these records are accepted by SHPO prior to demolition of the Transbay Transit Terminal.*

  ***Permanent* Interpretive Display.** *TJPA will direct the design and engineering team for the Undertaking to integrate into the design of the new terminal a dedicated space for a permanent interpretive exhibit. The interpretive exhibit will include at a minimum, but is not necessarily limited to: plaques or markers, a mural or other depiction of the historic terminal, and Key System, or other interpretive material.*

  *TJPA will consult with Department regarding the availability of historical documentary materials and the potential use of salvaged items from the existing Transbay Transit Terminal for the creation of the permanent interpretive display of the history of the*

*original Transbay Transit Terminal building and its association with the San Francisco-Oakland Bay Bridge and the potential salvaged items from the existing Terminal.*

*Department will assist TJPA in planning the scope and content of the proposed interpretive exhibit. In addition, TJPA will also invite the Oakland Heritage Alliance, the San Francisco Architectural Heritage, the California State Railroad Museum, and the Western Railway Museum to participate. TJPA, while retaining responsibility for the development of the exhibit, will consider, jointly with Department, the participating invitees' recommendations when finalizing the exhibit design. TJPA will produce, install, and maintain the exhibit.*

*TJPA will also consult with the City of Oakland about its interest in having a similar interpretive exhibit in the East Bay. If agreement is reached prior to completion of final design of the Terminal, TJPA will provide and deliver exhibit materials to a venue provided by the City of Oakland.*

***Museum Exhibit.*** *TJPA will consult with Department and the Oakland Museum about contributing to Department's exhibit at the Oakland Museum relating to the history and engineering of the major historic state bridges of the San Francisco Bay Area. TJPA will propose contributions to such an exhibit that may include an interpretive video including the history of the Transbay Transit Terminal and the Key System. Components to such an exhibit may include photographs, drawings, videotape, models, oral histories, and salvaged components from the terminal. In addition, TJPA will assist the Museum by contributing to the cost of preparing and presenting the exhibit, interpretive video, as well as the costs of an exhibit catalog or related museum publication in conjunction with the exhibit, in a manner and to the extent agreed upon by TJPA, Department, and the Oakland Museum of California if consultation results in agreement between TJPA and Oakland Museum prior to demolition of the existing Transbay Transit Terminal. TJPA has established a maximum budget of $50,000.00 for the Oakland Museum of California exhibit and the interpretive video.*

**Opportunities for Salvage.** *TJPA, in consultation with Department, will identify elements of the existing Transbay Transit Terminal that are suitable for salvage and interpretive use in the exhibit in the new Terminal or in museums. Within two years of signing of this agreement, TJPA will offer these items to San Francisco Architectural Heritage, the California State Railroad Museum, Sacramento, the Western Railway Museum, the Oakland Museum, and any other interested parties. Acceptance of items by interested parties must be completed at least 90 days prior to demolition of the Transbay Transit Terminal. TJPA will remove the items selected in a manner that minimizes damage and will deliver them with legal title to the recipient. Items not accepted for salvage or interpretive use will receive no further consideration under this agreement.*

*The above measures are* set forth in the MOA, *Appendix G of this Final EIS/EIR.*

### 5.14.4 Consultation and Coordination

*The Finding of Effect was transmitted to SHPO on August 29, 2003. SHPO concurred in the findings of effect presented herein on November 25, 2003; copies of their letters are provided in Appendix D. This environmental document presents measures designed to address impacts on archaeological and historic resources, as set forth in this section and in the MOA, Appendix G, Volume I of this Final EIS/EIR.*

## 5.15 HAZARDOUS MATERIALS

This section focuses on the risk of exposure to or releases of hazardous materials from *the* project. Impacts of hazardous materials sites related to construction of the Transbay Terminal, the Caltrain Extension, and the *R*edevelopment *P*lan *A*lternatives are discussed in Section 5.21.14.

Production and/or handling of new hazardous materials are not anticipated under the Transbay Terminal or Redevelopment Plan Alternatives. Hazardous materials handling for Caltrain operations is discussed below.

**Impacts from Hazardous Materials Used in Train Operations.** The proposed storage yard options would contain a fueling facility to provide diesel to non-electric locomotives served by the Fourth and Townsend Yard (e.g., trains that may come across the Dumbarton Bridge or from Monterey). Additionally, cleaning solvents associated with the routine maintenance operations would also be present on the site. This facility would involve services similar to those at the current Caltrain yard and, therefore, potential impacts would be similar to those under the No-Project Alternative.

The fueling facility would be constructed and operated to comply with local, state and Federal regulations regarding handling and storage of hazardous materials. Diesel fuel pumps would be equipped with emergency shut-off valves and, in compliance with U.S. EPA requirements, fuel USTs would be equipped with leak detection and monitoring systems. Any aboveground storage tanks would employ the use of secondary containment systems. These safeguards would limit the amount of diesel fuel that could potentially be released from a storage system, provide early detection in the event the storage tank should leak, and provide secondary containment to prevent the material from contaminating soil and/or groundwater. Cleaning solvents would be stored in 55-gallon drums, or other appropriate containers, within a bermed area to provide secondary containment. Paved surfaces within the fueling facility and the solvent storage area would be sloped to a sump where any spilled liquids could be recovered for proper disposal.

Handling and storage of fuels and solvents will follow California OSHA and local standards for fire protection and prevention. These measures include appropriate storage of flammable liquids and prohibition of open flames within 50 feet of flammable storage areas. Additionally, a Hazardous Materials Management/Business Plan would have to be filed with the CCSF Department of Public Health in addition to the handling and storage procedures described above. This is essentially the permit for the storage of these materials at the site.

## 5.16 VISUAL AND AESTHETICS

Visual changes attributable to the construction of a new Transbay Terminal, Caltrain Downtown Extension and implementation of the Redevelopment Area are described in this section, with resulting changes to views currently enjoyed by residents and other users of the area.

### 5.16.1 No-Project Alternative

Under the No-Project Alternative, there would be no visual/aesthetic changes to the project area. The Transbay Terminal would remain in its current location and low-cost capital improvements would be made to the building. These improvements would most likely focus on the operational aspects of the Terminal, and it is unlikely that the Terminal's aesthetic condition would be markedly improved. The Terminal would continue to obstruct southerly views from the north of the district, especially from Mission and Market Street. The existing elevated ramps to the Terminal would continue to loop through the area in their current position and would be retrofitted. The Caltrain rail service would terminate at the existing Fourth and Townsend station, and no tunnel would be constructed downtown.

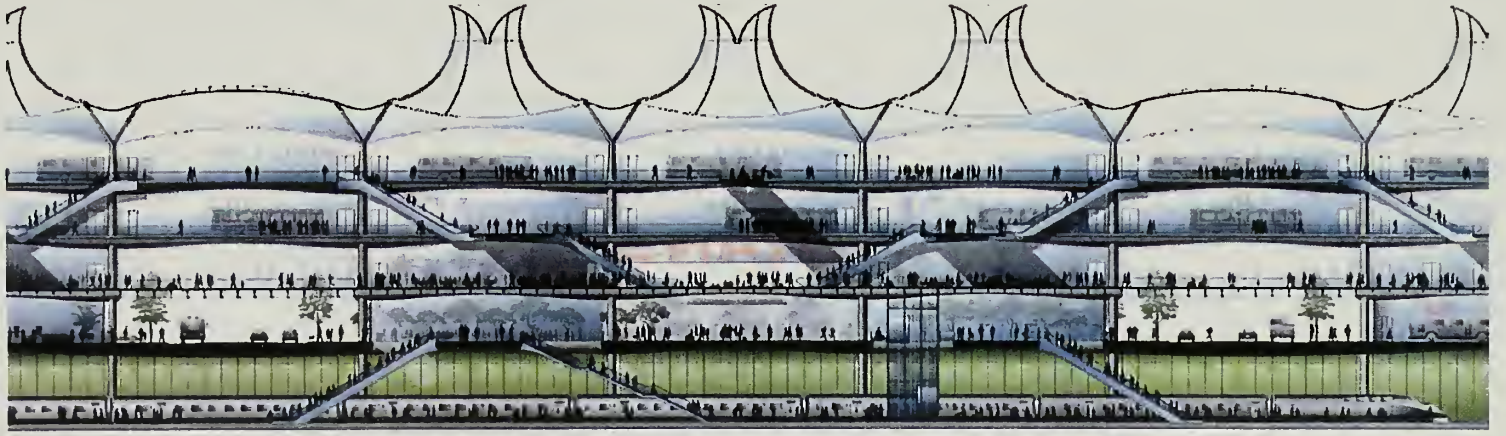
### 5.16.2 Transbay Terminal

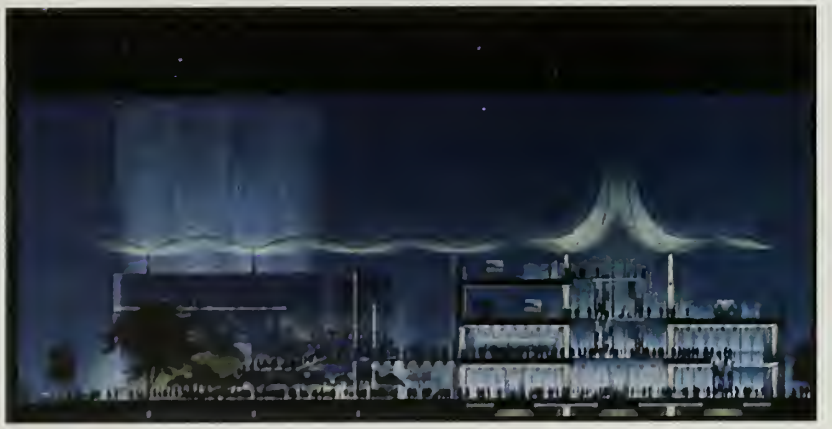
The new Transbay Terminal would be constructed on the site of the existing Terminal at First and Mission Streets. A current concept for the new Terminal would be about 109 feet tall to its roofline, with ten cone-shaped roof elements that would reach up to 156 feet above the street level. Under the Loop Ramp Alternative, the new Terminal would be about one story shorter.

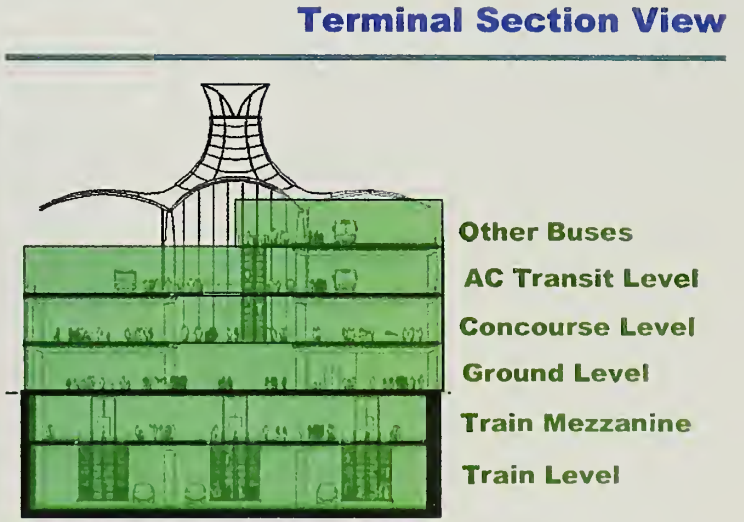
The Terminal itself would generally occupy the same building footprint as the existing Terminal structure, *but approximately 150 feet to the west.* The Terminal would span parts of the First *and* Fremont street blocks, for a maximum length of 1,300 linear feet. The building's horizontal orientation would contrast with the surrounding high-rise development, especially along its east (e.g., 100 Mission Street) and west sides (e.g. 199 Fremont Street).

The design of the proposed Transbay Terminal building would be contemporary and could become a point of visual interest in the Transbay Redevelopment Area. The current concept for design of the new Terminal is shown in Figure 5.16-1.

**Figure 5.16-1: Current Design Concept for Transbay Terminal Building**







The structure would be constructed out of glass and other transparent elements, with the intent of allowing natural light to penetrate the inside of the Terminal building. Due to the transparent nature of the proposed building, views of the built environment outside the new Terminal structure may be possible from within. The use of transparent building materials and the cone-shaped roof elements, along with gently curved roof-overhangs, would contribute to the visual identity of the area. A proposed plaza and landscaped pedestrian areas surrounding the Transbay Terminal to the east would visually enhance the pedestrian environment.

Under the West Ramp and Loop Ramp Alternatives, ramps leading in and out of the Terminal and to and from the Bay Bridge would be either stacked or split. *Figure 5.16-2 provides a visual simulation of the stacked ramps associated with the West Ramp Alternative.* The ramp spans would be supported by columns and abutments and contain a constant cross-section throughout to give the appearance of a relatively thin structure through strong thin edge lines and imposed shadow.

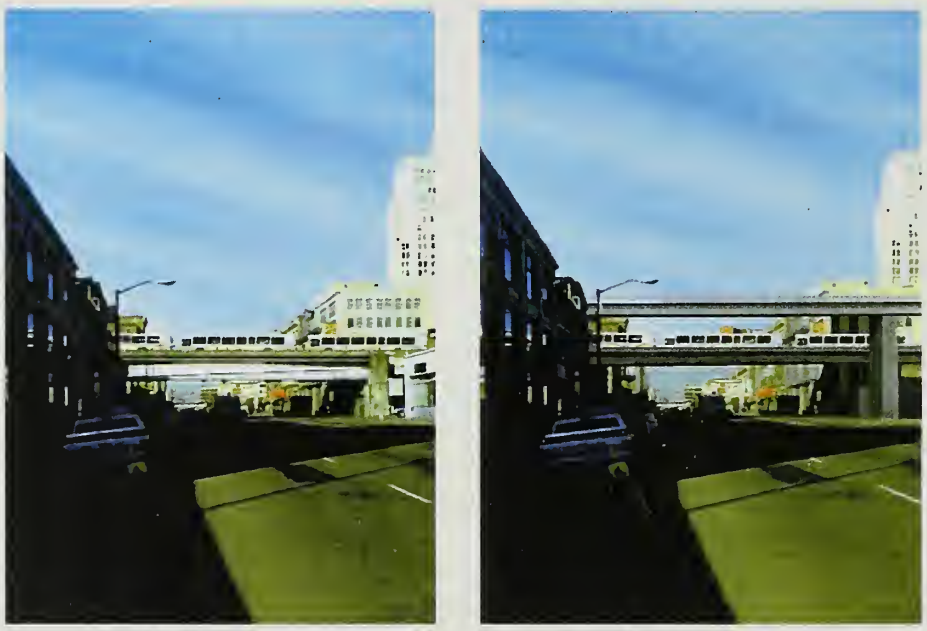



**Figure 5.16-2: Visual Simulation of Stacked Ramps at Howard Street ( West Ramp Alternative)**

The proposed ramps would occupy considerably less area than the existing ramps, and would be split, breaking up the mass of the ramps and allowing views between the two new ramp sections. Although the new decks would be approximately 30 feet tall, they would be less visually intrusive due to their uniform appearance and minimal supporting structures.

The southern and eastern portions of the existing ramp network would be demolished under the West Ramp Alternative, eventually opening up the eastward and southward views outside of the Transbay Redevelopment Area. Removing the eastern section of the ramps would open up eastward views along Howard Street toward the Bay and the East Bay Hills. Views toward Rincon Hill, currently obstructed by the southern loop of the existing ramp network, would be opened up along Beale, Fremont, and First Streets. This segment of the ramp network would not interrupt northern views from Rincon Hill into the Transbay Redevelopment Area.

Under the Loop Ramp Alternative, such new views would not be possible, because the ramp network would be retrofitted and retained as it currently exists.

### 5.16.3 CALTRAIN DOWNTOWN EXTENSION

Visual/aesthetic changes would occur with either of the Caltrain Downtown Extension alternatives. A fenced and open trench with concrete retaining walls dropping to some 30 feet in depth would be constructed south of Townsend Street and to the west of Fifth Street along the northern edge of the current Fourth and Townsend Yard. The alignment would enter a tunnel portal near Fifth Street and continue below grade to the Transbay Terminal.

Construction of the cut-and-cover tunnel for the Caltrain Extension between Fifth Street and the Transbay Terminal would entail the acquisition and demolition of all existing buildings under which the alternative alignments would pass. Following construction of the underground extension, however, it is anticipated that new buildings would be constructed as vacant sites become available for resale. It is currently assumed that the new buildings would be similar or larger and higher than the buildings that are demolished on the sites. Other aesthetic effects would occur due to construction activities, and would be temporary in nature.

The buildings in the Second and Townsend Street area would not be demolished but would rather remain under the Tunneling Option for either Caltrain Extension Alternative. For more information regarding potential construction-related effects, please see Section 5.21, Construction Impacts.

### 5.16.4 REDEVELOPMENT

Development planned under the proposed redevelopment component would remove existing features with low visual value, including surface parking lots, and in some cases, deteriorated buildings, potentially enhancing the aesthetic quality of the Transbay Redevelopment Area. The overall character of the Transbay Redevelopment Area would continue to experience a change that has been underway for several years, from a predominately low-rise area dominated by early 20th century industrial buildings and interspersed with surface parking lots, to a more dense urban area of newer mid- and high-rise buildings over 80-foot high bases, interspersed with designated areas of open space.

Visual changes would occur under both redevelopment alternatives, in that the proposed redevelopment area would experience a relatively large increase in the number and size of buildings. Both the Full-Build and Reduced Scope alternatives would change the zoning on the former freeway parcels to allow for development at greater heights— up to a maximum building height of 400 feet on the north side of Folsom Street— 200 feet higher than is now permitted. An alternative urban design concept would produce taller and more slender structures with smaller floor plates. These structures could be on average up to fifty feet higher if developed to their full building-envelope potential. From an urban design standpoint, structures constructed under this alternative, while taller, would be less bulky and therefore would do more to preserve views.

Even under the No-Project Alternative, the former freeway parcels would ultimately be expected to be developed, as rezoning from the current P (Public) use district could occur over time. The height limit might not be raised, however, so any development could occur at a lesser scale.

With the West Ramp or Loop Ramp Alternative, development within and near the Terminal loop ramps would be expected to serve to some extent as a transition between the several office towers near Market Street and along Main and Spear Streets, and in the area south of Howard Street. This area now includes newer and renovated low- and mid-rise office, multi-media, and residential structures. Toward Market Street, there would likely be an increase in taller office towers, which would make up most of the office space anticipated in the Transbay Redevelopment Area, but whose visual effect would be lessened by the fact that these buildings would merely extend the downtown core and would not appear as a cluster of taller buildings in a low-rise environment.

Changes would be noticeable in the area inside the existing Transbay Terminal loop ramps. In particular, if a new Terminal is built at the First and Mission site under the West Ramp Alternative, the existing ramps east of Beale Street would be demolished, encouraging the replacement of many older, smaller structures with new development at a larger scale. Changes are anticipated within the existing terminal ramps, as evidenced by recently completed

construction at Fremont and Howard Street (199 Fremont Street) and the Foundry Square project development at and near First and Howard Streets, currently under construction.

Of the existing visually cohesive areas within the study area, the least change would come to the New Montgomery-Second Street Conservation District and South Park, where building height limits would remain lower than in surrounding areas and zoning controls that encourage preservation and reuse of existing buildings would remain in place. Development of surrounding blocks (north of the Bay Bridge approach), however, would be expected to bring closer the backdrop of office towers that has until recently been limited to the north end of the district.

Folsom Street would undergo the most visible change in the district. The northern side of Folsom Street, from First to Spear Streets, would be developed with a mix of uses in structures that could range in height from 350 to 400 feet.

Figure 5.16-3 shows a *visual simulation* of the possible redevelopment in this area. Provisions along Folsom Street would include widening the sidewalk and the creation of public open space along the street frontage to enhance the street-level pedestrian environment. This scenario is not an actual proposal but a representation of the types and levels of development that have been conceived for this portion of the Redevelopment Area. *The simulation is of development as envisioned in the Draft Transbay Redevelopment Project Area Design for Development Vision (D4D), released by the San Francisco Redevelopment Agency in August 2003.* Actual development proposals would be defined and evaluated and undergo individual environmental review, *if necessary,* in subsequent steps of the redevelopment process *to make sure that the individual projects were covered.*

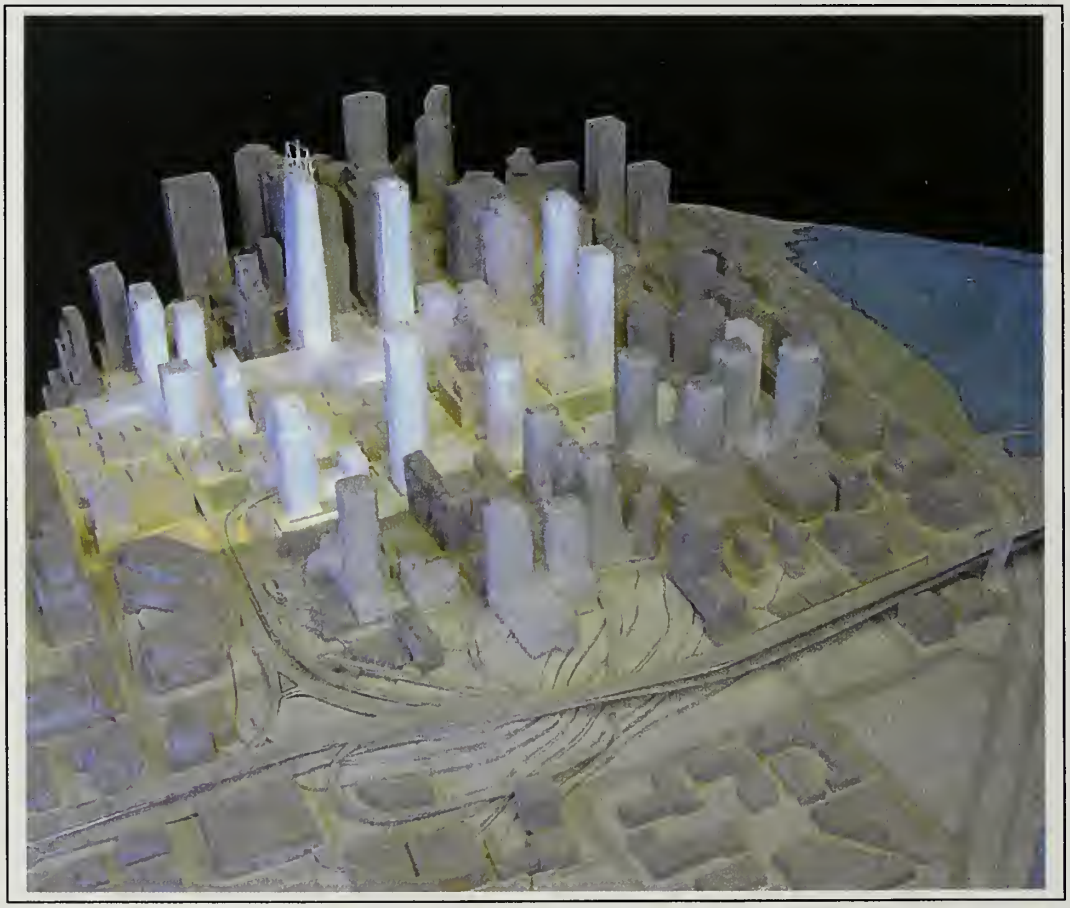
In addition to the widened north sidewalk of Folsom Street, it is anticipated that one or more large areas of open space would be provided in conjunction with the development of the Transbay Terminal and Redevelopment Area. Open space could be provided in the form of a public plaza, proposed to be located in front of the new Transbay Terminal on the western frontage of First Street, bounded by Mission Street to the north, Fremont Street to the east, and the proposed Terminal structure to the south. Other open spaces could add visual interest to mid-block areas and provide a buffer to the planned development in the Transbay Redevelopment Area.

Despite new construction, the Transbay Redevelopment Area would retain portions of its historic, smaller-scale development, notably in the New Montgomery-Second Street Conservation District. Second Street could also become a major visual pathway for pedestrian travel between downtown and the Transbay Redevelopment Area, and the adjacent neighborhoods of South Beach and China Basin.

### 5.16.5 Changes to Scenic Views or Vistas

Increased development would result in the loss of some existing views, particularly across the study area, rather than along the streets. View corridors would remain, however, particularly along Folsom Street with the planned building setbacks along the north side of the street. Depending on the outcome of the Transbay Terminal component, removal of some of the existing elevated ramps could open up views from within the area now visually walled off by these elements. *The West Ramp Alternative has been identified for the Transbay Terminal component of the Locally Preferred Alternative (LPA). If the LPA is adopted as the project, this Transbay Terminal Alternative would remove the existing east loop ramp and open views to the east; new elevated ramps would be constructed in the same footprint as the existing west loop ramp.*

**Figure 5.16-3 *Simulation of* Potential Redevelopment Sites and Scale**



Views within and across the Transbay Redevelopment Area would generally be limited by new development. With the implementation of either the Full-Build or Reduced Scope alternative, possibilities for views across the district would be lessened. High-rises located in the Financial District north of the Transbay Redevelopment Area, which create a visual boundary between the Financial District and the generally lower-scale development south of Mission Street would gradually be developed within the Transbay Redevelopment Area. The clearly defined northern boundary of the Transbay Redevelopment Area would, over time, move southward, and the visual wall created by the existing high-rise development would become less pronounced when viewed from the Transbay Redevelopment Area.

Block sizes in the Transbay Redevelopment Area are up to four times larger than the blocks north of Market Street. Under either the Full-Build or Reduced Scope Alternative, larger footprints and taller buildings would likely define new development, with the blocks generally less densely developed than those blocks north of Mission Street. Thus, even though it is likely that land uses would be intensified, there would likely be more space between the towers than on the blocks north of Market Street. New development within the Transbay Redevelopment Area would contain mid-block pedestrian passageways to further reduce the scale of the blocks. Inner courtyards and pedestrian plazas proposed as part of both Redevelopment Alternatives would visually enhance the streetscapes along Folsom Street for pedestrians.

New development under either the Full-Build or the Reduced Scope Alternative would be required to follow urban design guidelines that the Redevelopment Agency would establish to enhance views and visual interest in the project area. New development proposed along Folsom Street would be set back 15 feet from the property line to preserve the existing view corridor (providing views of the Bay to the east) and to accommodate future landscaping, which would provide visual interest and create a green buffer against the traffic on the street. Under both alternatives, new towers would also have an 80-foot podium height, which would create an orderly and regular street wall.

Under both Redevelopment Alternatives, proposed new development along Folsom and Howard Streets would consist of dual towers above their 80-foot base. This would decrease the mass of the buildings above their base levels and provide more views of the sky and surrounding development, as well as increase solar access to lower levels. Under one urban design alternative, new towers above their 80-foot base would have an approximate diagonal dimension ranging from 160 to 190 feet. Under the optional design alternative, new towers would have a diagonal dimension ranging from 126 to 156 feet. Thus, the second alternative would create less bulky buildings with smaller floor plates, which would appear taller and more slender than the development proposed under the first. However, because both design variants would employ setbacks and create a regular street wall at the ground level, given the scale of existing development surrounding the Transbay Redevelopment Area, effects on existing views would not be considered adverse.

### 5.16.6 Change in the Cityscape

Potential changes to the San Francisco cityscape as a result of the proposed Redevelopment Area are shown in Figure 5.16-*3*. Views of the Transbay Redevelopment Area would become more differentiated as the stepping up of development heights towards downtown (north of Folsom Street) is realized. Assuming construction of the proposed Transbay Terminal and possible demolition of the eastern loop of the existing bus ramps, the wall that is composed of newer high-rise office construction would advance southward, with building heights decreasing towards Folsom Street. This change would be apparent from distant vantage points, such as from Dolores Park, Twin Peaks and Potrero Hill.

Changes to the height and bulk in the Transbay Redevelopment Area from their current limits (see Table 5.1-1) would generally follow the urban design policies contained in the San Francisco General Plan. The proposed height limits, with the tallest buildings located in the north of the Transbay Redevelopment Area toward Market and Mission Streets and then decreasing somewhat from their maximum heights to between 350 to 400 feet along Folsom, would become gradually shorter south of Folsom Street. Moving east toward the Bay, height limits would gradually step down from a maximum of 400 feet along Folsom to approximately 200 feet at Spear Street, then down to between 84 and 65 feet along The Embarcadero to protect views of the water.

Although the proposed new development would be expected to alter the existing aesthetic nature of the area, the visual features that would be introduced by the project are commonly accepted in urban areas and would not substantially degrade the existing visual quality or obstruct publicly accessible views. In addition, the Redevelopment Area's provision for design amenities such as open spaces and landscape features, view corridor preservation, and pedestrian enhancement suitably address the proposed growth and ensure that the resultant effects would be predominately positive. For this reason, the project would not result in a demonstrable negative aesthetic effect and as such, no mitigation measures are proposed.

### 5.16.7 Light and Glare

New construction in the Transbay Redevelopment Area would generate additional night lighting in the area, but not in amounts unusual for a transportation hub in a developed urban area. As shown on Figure 5.16-1, the current concept for the Transbay Terminal entails the use of transparent building materials. This concept is intended to provide visual identity and increased security for passengers within the Terminal and in the surrounding pedestrian areas.

New buildings and vehicles would also produce additional glare. This would not be expected to result in a substantial change unless buildings were constructed with reflective glass. Although perceived as an appealing design element to some, mirrored glass is more likely to generate

glare, and to create a potential annoyance and even safety hazard when directed by the sun towards the street or sidewalk. Mirrored glass is not permitted in San Francisco outside of redevelopment areas, per City Planning Code Resolution 9212; as a result, where it is used, it creates a more noticeable visual impact. Therefore, per the Design for Development, mirrored glass would not be permitted in the Transbay Redevelopment Area.

Although the proposed new development would be expected to alter the existing aesthetic nature of the area, the visual features that would be introduced by the project are commonly accepted in urban areas and would not substantially degrade the existing visual quality, obstruct publicly accessible views or generate obtrusive light or glare. In addition, the Redevelopment Area's provision for design amenities such as open spaces and landscape features, view corridor preservation, and pedestrian enhancement suitably address the proposed growth and ensure that the resultant effects would be predominately positive. For this reason, no mitigation measures are proposed.

### *5.16.8 Draft Transbay Redevelopment Area Design for Development Vision (August 2003)*

*All of the visual and aesthetic effects of the Draft Transbay Redevelopment Area Design for Development Vision would be similar to and less than those of the Full Build Alternative. Similar to the Full Build Alternative, the Design for Development Vision would contain towers over podiums and would create a continuous streetwall along Folsom Street. However, compared to the Full Build Alternative, each block of the Design for Development Vision would contain a single tall tower as a part of the Folsom Street frontage instead of two. Thus, the less-dense Design for Development Vision would have a more varied height pattern than would the Full Build Alternative because of a greater mix of building heights (65 feet to 550 feet). For that reason, the visual and aesthetic effects associated with the Design for Development Vision would be similar to, but less than those under the Full Build Alternative, and its effects also would not be substantially adverse.*

## 5.17 SAFETY AND SECURITY

Safety refers to the prevention of accidents to the riding public, employees, or others present near the Transbay Terminal, Caltrain facilities, and in the Redevelopment Area. Transit vehicle accidents may be caused by events such as fires, faulty equipment, improper boarding or alighting of the transit vehicles or conflicts between trains, buses, automobiles, pedestrians, or non-motorized vehicles. Security refers to the prevention of unlawful acts resulting in harm to persons or damage to property. In a broader sense, it also implies freedom from threats or uncertainty about the likelihood of threatening acts. In this context, the No-Project Alternative does not present potential impacts; therefore, this section focuses on the proposed Project.

### 5.17.1 Safety and Security in Station Areas

The San Francisco Police and Fire Departments would be responsible for safety and security in the redevelopment area. This remaining discussion focuses on the rail and bus transit facilities.

Passengers exiting the Transbay Terminal or the Caltrain stations at Fourth and Townsend would be transferring to another form of public transit or walking to their destination. The station and Terminal areas would be lighted and have designated walkways for pedestrians.

Bus or rail passengers disembarking at the Terminal would gain access to other public transportation typically at the street level. There could also be an underground concourse connecting the Transbay Terminal and Train Station to the Embarcadero BART/Muni Metro Station at Market Street. Passengers disembarking at either station and walking to their destinations would use sidewalks and crosswalks.

The separation of the AC Transit Buses and the Caltrain from the street levels would reduce the conflicts between these transit modes and pedestrians, except at the platform and bus loading areas. Pedestrian impacts are discussed in more detail in Section 3.4.1.

Security at the Transbay Terminal would be the responsibility of the *TJPA*. Caltrain station security is currently provided by the JPB via its contract with Amtrak. Security would be increased over present levels commensurate with the increase in amount of activity at the Terminal and train station. The Terminal's bus and train loading areas and passageways would be open and clearly lighted and clear sight lines would be maintained. Public security would not be adversely affected by operation of the Transbay Terminal or the Caltrain Extension and new station.

Fire protection at the Terminal would be provided by the San Francisco Fire Department. Fire sprinklers, stand pipes, smoke/gas detectors and alarm systems would be placed throughout the Terminal and stations per City of San Francisco Fire Department requirements. Public fire safety would not be adversely affected by operation of Terminal or proposed Caltrain station. Refer to Section 5.21.17 on best construction management practices for the safety of construction workers, local residents, and employees during project construction.

## 5.18 ENERGY

Energy reliability and supply have become an increasing concern in California. The short-term situation has been very unstable for both price and availability of electricity and, to a lesser extent, natural gas. The Transbay Terminal/Caltrain Downtown Extension/Redevelopment

Project would require energy to construct, operate, and maintain the transit facilities and for the redevelopment land uses.

Energy for construction includes, in addition to the energy used by construction equipment and other activities at the worksite, the energy used to manufacture equipment, materials and supplied and transport them to the worksite. Energy consumed in the operation of transportation systems is primarily that used by vehicles transporting people or goods—propulsion energy—plus ongoing energy use of operating facilities. Energy for maintenance includes that for day-to-day upkeep of equipment and systems as well as the energy embedded in any replacement equipment, materials, and supplies.

Energy consumed in operation of transportation systems is typically referred to as direct energy. Energy consumed in construction and maintenance is referred to as indirect energy. Over the life of a transportation project, direct energy consumption is usually the largest component of total system energy use. Vehicle propulsion energy can amount to 60 percent of total system energy (Energy and Transportation Systems, Caltrans, Division of Engineering Services, July 1983). In the current environment, the ongoing energy requirements of new activities are of concern, including their long-term impacts on energy supplies. From an energy conservation standpoint, therefore, direct energy impacts are of more importance than indirect energy impacts. For these reasons, the energy analysis focuses on direct rather than indirect energy requirements of the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project. It compares estimated energy use in the regional transportation with and without the proposed project improvements. The analysis identifies the incremental change in transportation system energy use, including all major modes of ground transportation, associated with the project.

**Electricity.** Caltrain trains operating over the approximately 1.2 mile rail extension would be electrically powered. A number of facilities in the tunnel segment, station, Transbay Terminal, and associated facilities would use electricity to power equipment. Currently the City and County of San Francisco owns and operates the Hetch Hetchy hydroelectric power generating facilities in the Tuolumne River watershed (in Yosemite National Park). These facilities supply the majority of electrical power to the city, which is delivered to users by Pacific Gas & Electric Company's (PG&E) electrical transmission and distribution system. San Francisco does not require the full generating capacity of the Hetch Hetchy facilities and has entered into long-term power supply contracts with other agencies. Depending upon seasonal power generation capacity, contract obligations to others, local demand, and other circumstances, the city may receive power through the PG&E grid from other electrical generators, including PG&E itself. Redevelopment would use these or other currently available sources of energy.

When electrified, Caltrain would receive power through the PG&E system. Whether the City and County of San Francisco would be the generator/supplier is unknown. Under deregulation, Caltrain would have the option to purchase from any generator/supplier with generating facilities in the western United States. Deregulation is intended to introduce competition into the local

supplier market to expand sources of power supply and ensure fair pricing. The structure of deregulation is open to scrutiny in California, however, as a consequence of the price and supply problems that became apparent in 2000. Although it is difficult to predict what changes may occur, it is anticipated that deregulation of the electric power market will be retained in some form. A number of power generating plants are under development in California and adjacent states by various private firms. The current supply problems and corresponding price volatility would diminish or disappear as these plants come online. Deregulation would allow Caltrain to contract with any number of generators/suppliers to ensure the long-term availability of power for operations, including operation of the Terminal/Extension Project.

**Other Energy Sources**. The Transbay Terminal / Caltrain Downtown Extension / *Redevelopment* Project would require energy in the form of natural gas, gasoline, diesel fuel, and possibly other forms of energy for facilities and equipment operations (e.g., heating, lighting, ventilation, and operation of non-revenue equipment). For natural gas, PG&E owns the final delivery and distribution systems. PG&E purchases natural gas from various suppliers. Natural gas produced within the state of California has decreased to below 16 percent of demand and therefore other regions and countries are now the major source of supply (California Energy Commission web site: www.energy.ca.gov). As of October 2000, there were 38 marketers/suppliers to the PG&E system. Despite some recent short-term volatility in gas prices, long-term supply is considered satisfactory. Interstate pipeline distribution systems have experienced capacity constraints; however, pipeline expansion is underway in some corridors and several applications for capacity additions are pending. Similarly for gasoline and diesel fuels, long term supply is not considered a critical issue; there are numerous suppliers. In the near term, refining capacity appears to be the major short-term constraint contributing to price volatility. Also, alternative fuel sources are emerging to provide substitute fuels for gas and diesel engines.

**Impacts.** The Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project would increase energy consumption for new land uses, train propulsion, and for transportation facility operations. However, it would also reduce the consumption of energy by other modes as a result of diverting travel *from* auto and bus to commuter rail service.

Changes in direct energy use by the *t*ransit providers affected by the project were estimated for 2020. Changes are relative to estimated energy use under the No-Project Alternative. The analysis evaluated travel patterns for three basic transportation modes: commuter rail; other transit in the form of bus; and auto as representative of roadway traffic. Commuter rail operations would increase with the Transbay Terminal/Caltrain Downtown Extension/ Redevelopment Project. The increase was quantified and expressed in terms of the additional vehicle miles of travel generated by operating *132* revenue trains a day along the approximately 1.2 mile downtown extension. Adjustments were also made to account for increased non-revenue movements and switching movements associated with operations on the extension.

Some bus operations would be reduced somewhat because commuter rail would be extended to downtown San Francisco and provide a higher-level transit alternative. SamTrans, for example, is expected to be able to convert several express routes *in the Caltrain Corridor* to Caltrain feeders and not need to continue bus service to downtown San Francisco. San Francisco Muni may be able to reduce some existing shuttle service between downtown and Fourth and Townsend Streets. The analysis, to be conservative, assumed Muni service would be redirected and only included the more identifiable changes to SamTrans bus service. The potential reduction in bus trips was calculated by assuming express service in the immediate corridor would become Caltrain station feeders; trips were converted to vehicle miles saved by multiplying by the one-way travel distance between the proposed feeder station and downtown San Francisco. Auto travel in the corridor would also be reduced as more people diverted to commuter rail service. The reduction in auto travel was estimated by assigning a weighted average trip length for all diverted trips, assumed to be represented by the number of new riders on Caltrain with the extension in place in 2020.

Table 5.18-1 provides a summary of estimated propulsion energy effects of the Transbay Terminal and Caltrain Downtown Extension for these modes. For a common standard of comparison, energy in the form of electricity or fossil fuels consumed (or saved) is converted to British thermal units (BTUs). Energy use is expressed in terms of the direct energy content of electricity and fuels consumed (or saved) at the final source as well as the total energy content of these energy units, which accounts for generation/refining and transmission/transport losses. For instance, a kWh has a final energy content of 3,416 BTUs; but an additional approximately 7,100 BTUs of energy was required to generate, transmit and convert the kWh at its point of use. The total energy content of a kWh is estimated to be, therefore, approximately10,500 BTUs.

While the increased travel distance for commuter rail trains would require an additional *2.2* million kWhs annually, or *7.4* million direct BTUs and *22.7* million total BTUs, the savings in bus miles and auto vehicle miles no longer operated would be approximately 360 million direct BTUs and 430 million total BTUs. The net energy impact of the transit operations for the Transbay Terminal and Caltrain Extension would be an overall decrease, or savings, in propulsion energy use.

In addition to the propulsion energy effects of the Terminal/Extension transit operations, the operation of the rail station, tunnel, and Transbay *T*erminal would result in ongoing energy use, mainly in the form of electricity for lighting, ventilation, communications, escalators/elevators for people transport, and heating/cooling. A general estimate of annual electricity use by these facilities is 2.5 million kilowatts, equivalent to 8,540 million direct BTUs and 26,250 million total BTUs of energy.

There would be no offsetting reduction in energy use elsewhere; facilities energy represents a net new energy requirement. Adding the facility energy to propulsion energy requirements approximately doubles the energy consumed by the transit operations associated with the Project.

**Table 5.18-1: Change in Propulsion Energy Consumption Resulting from Terminal/Extension Project (2020)**

| Model | Tech-nology [1] | Energy Use Per Vehicle Mile [2] | Incremental Change from No-Project (Project Minus No-Project) | | | | |
|---|---|---|---|---|---|---|---|
| | | | Weekday Vehicle Miles | Annual Vehicle Miles[3] | Energy Units Consumed (Saved) | Direct Energy Consumed [4] (Saved) in Millions of BTUs | Total Energy Consumed [5] (Saved) in millions of BTUs |
| Commuter Rail | Electric | 9.500 kWh | *785* | *228,000* | *2,166,000* kWh | *7,399.1* | *22,743.0* |
| Other Transit—Bus | Diesel | 0.333 gal | (3,600) | (935,000) | (311,667) gal | (38,958.3) | (44,802.1) |
| Auto | Gasoline | 0.035 gal | (260,000) | (83,200,000) | (2,912,000) gal | (321,484.8) | (385,781.8) |
| **Total All Modes** | | | ***(262,815)*** | ***(83,907,000)*** | | ***(353,044.0)*** | ***(407,840.9)*** |

[1] Actual fleets may be mixed with more than one significant propulsion technology (e.g., diesel, CNG, or hybrid buses; gasoline or hybrid autos/trucks). The technology listed is considered representative for the entire mode and provides a reasonable approximation of energy use in BTUs.

[2] Commuter rail electricity use rate is estimated consumption per passenger car mile for either electric locomotive propelled fleet or electric multiple unit (EMU) fleet. It assumes a 10 percent reduction in consumption due to regeneration, i.e., the return of electrical current to the power system by braking vehicles.

[3] Weekday forecasts of vehicle miles are annualized using the following factors: Commuter Rail = 290; Other Transit = 290; Auto = 320

[4] Direct energy is that consumed by the end user--the rail locomotives, buses, and autos. Direct energy content of energy units is as follows:

1 kWh= 3,416 BTUs (British Thermal Units)

1 gallon diesel = 125,000 BTUs

1 gallon gasoline = 110,400 BTUs

[5] Total energy includes the energy used to refine/generate and transport energy to the end user as well as the direct energy consumed, as follows:

1 kWh= 10,500 BTUs

1 gallon diesel = 143,750 BTUs

1 gallon gasoline = 132,480 BTUs

**Sources:** Caltrain 25kV, 60Hz, ac Electrification Program, Overview of Preliminary Engineering Operating and Maintenance Costs, Parsons, July 2001; Nelson\Nygaard Consulting Associates; Parsons Transportation Group

The combined propulsion and facilities electrical energy requirements would, however, still be more than offset by the estimated energy savings to other modes that result from the project (Table 5.18-1). New land uses under the Redevelopment portion of the Project would, however, consume additional energy.

No energy mitigation measures appear to be warranted. Moreover, current designs for the Transbay Terminal include "a wide ranging sustainable approach to the terminal building that

uses the natural wind flows in downtown San Francisco to ventilate and cool the facility, harnesses solar energy for passive hearing and cooling, and established sustainability protocols for materials, construction procedures, and long-term building operations." [28] Additional measures would be included in the design and specification of equipment to ensure energy efficiency, thereby helping to reduce the long-term energy requirements and the operating costs of the project.

## 5.19 TRANSIT, TRAFFIC AND PARKING

Current transportation setting and projected No-Build conditions as well as projected Caltrain ridership and travel times for the Caltrain Extension Alternative are described in Chapter 3. Transportation impacts during construction are evaluated in Section 5.21.1. All other transportation effects of extending Caltrain to the Transbay Terminal Site are presented in this section.

### 5.19.1 Transit Operational Impacts

The Terminal/Extension Project includes two possible alignments for the Caltrain downtown extension, two design options for the new Transbay Terminal, and two scenarios for a redevelopment plan. In addition, there is an option for an underground pedestrian connection between the new Terminal and the Embarcadero BART station.

With regard to transit operations, only the two alternatives for the Transbay Terminal design–the West Ramp and the Loop Ramp Alternatives–would have notably different effects on transit. As a result, this analysis of operating impacts is divided into two scenarios, one for each of the Transbay Terminal alternatives. The intermodal connections enabled by the pedestrian connection to BART are summarized at the end of this section.

Impacts on transit operations would differ across the two terminal alternatives in terms of:

- Terminal capacity
- Bus access to the Transbay Terminal from the Bay Bridge
- Bus access to the terminal from the street
- Internal bus circulation within the Transbay Terminal
- On-street bus circulation
- Bus storage
- Operating costs

[28] Transbay Terminal Improvement Plan, MTC, 2001, pg. 18.

Major operational differences between the two alternatives are described in Table 5.19-1.

### 5.19.1.1 West Ramp Alternative

The West Ramp Alternative would change the current configuration of how buses enter, exit, and park at the Transbay Terminal. Instead of traveling straight through the terminal and circulating back to the Bay Bridge along an external, aboveground loop, buses would turn around within the terminal using an internal loop. With the West Ramp *A*lternative, the on- and off-ramps connecting the terminal with the bridge would both be located at the west end of the terminal. The current *operating* distance *from* the *bridge to the* terminal *back to* the bridge is 6,500 feet. Under the West Ramp Alternative, this distance would increase to approximately 7,600 feet. [29] *It should be noted that this round trip distance is slightly longer than the similar path under the Loop Ramp Alternative because the terminal is slightly longer, owing to the use of two longer platforms rather than three somewhat shorter platforms.*

**Table 5.19-1: Operational Differences Between Transbay Terminal Alternatives**

| Operational Issues | Existing Terminal | West Ramp Alternative | Full Loop Alternative |
|---|---|---|---|
| **Total Number of Bus Bays** | 32 | *48* | 51 |
| **Location of Bus Storage** | On-site Ramps | Off-site storage lot | On-site ramps and off-site storage lot |
| **Travel Distances (in Feet)** | | | |
| Bay Bridge to Terminal *to Bay Bridge* | 6,500 | 7,600 | 6,500 |
| Bay Bridge to Terminal to Storage Area (1) | N/A | 7,600 | 6,500 |
| Storage Area to Terminal to Bay Bridge (1) | N/A | 7,600 | 6,500 |
| Bay Bridge to Storage Area to Terminal to Bay Bridge (2) | N/A | 8,100 | 7,000 |
| From Ramp to Terminal | 4,500 | N/A | *4,500* |
| **Travel Times (in Seconds)** | | | |
| Bay Bridge and Terminal *to Bridge* | 216 | 317 | 227 |
| Bay Bridge to Terminal to Storage Area [1] | N/A | 329 | 243 |
| Storage Area to Terminal to Bay Bridge [1] | N/A | 334 | 240 |
| Bay Bridge to Storage Area to Terminal to Bay Bridge [2] | N/A | 350 | 255 |
| From Ramp to Terminal | 60 | N/A | *60* |

**Notes:** [1] Trip refers to deadheading. Since the existing terminal accommodates bus parking on-site, no deadheading or off-site staging is currently involved with AC Transit operations.

[2] Trip refers to off-site staging at the bus storage area. Off-site staging is greatest for the West Ramp Alternative because there are only four to five on-site staging spaces on the ramps.

**Source:** SMWM, Working Paper 4.1 Evaluation of Terminal Site Alternatives, January 2000. Travel times and distances were estimated by Fehr & Peers based upon preliminary terminal designs for the West Ramp and Full Loop Alternatives.

[29] SMWM Working Paper 4.1 Evaluation of Terminal Site Alternatives, (January 2000), p.37

The existing east loop ramp leading from the Bay Bridge to the Transbay Terminal is currently used for midday-storage of AC Transit vehicles. The West Ramp Alternative would relocate AC Transit bus storage to an off-site area under the replacement Bay Bridge West Approaches, between Second and Third Streets. Storage of Golden Gate Transit buses would be moved from their current off-site storage at Main and Howard to beneath the Bay Bridge approaches between Third and Fourth Streets.

AC Transit buses would operate independently of local traffic between the Bay Bridge, the storage area, and the Transbay Terminal. Direct connections would be provided on elevated ramps constructed along the Essex Street right-of-way in approximately the same location as the existing west loop ramps. With the buses entering and exiting the terminal from the west end only, the existing east loops would be permanently removed.

The new Transbay Terminal would feature:

- Three center island rail platforms supporting the six future tracks in the basement level.
- Muni and Golden Gate Transit bus operations, patron entry, ticketing, joint development and a Greyhound store front on the street level.
- Pedestrian concourse with retail/joint development that runs the full three-block length of the Terminal, one level above the street.
- Thirty AC Transit bus bays serving a central platform two levels above the street.
- A platform for Greyhound, paratransit and private operators on the top level or upper bus deck.

**Terminal Capacity.** The West Ramp Alternative would significantly increase the passenger capacity of the Transbay Terminal. The new terminal would accommodate 35,000 rail and bus passengers during the peak hour. This is 11,000 more passengers than the 24,000 passengers projected for peak hour demand in 2020. The current peak hour passenger flow at the existing Terminal is 10,000 passengers. [30]

The terminal would also accommodate significant increases in transit service. Currently, AC Transit's highest peak utilization is 4.5 buses per bay per hour, which corresponds to average headways of 13.3 minutes per bay. The new terminal would accommodate eight-minute average headways at each of the 30 bus bays, thereby accommodating future demand and future growth.[31] The West Ramp Alternative would increase the total number of bus bays from 32 to *48, with 30 on the AC Transit level and another 18 on the upper bus level.*

[30] Arup, Working Paper 7.0 Pre-Concept Engineering Report, (April 2001), p. 5.

[31] Arup, p. 3-4

**Bus Access to the Transbay Terminal from the Bay Bridge**. Bus access to the terminal would no longer have separate points for entry and exit on opposite sides of the facility. Under the West Ramp Alternative, *each of the two bus decks would have dedicated, fully grade-separated ramps leading from the Bay Bridge into* the southwestern corner of the terminal. Although bus entrances would be provided on both the upper and lower bus decks, all buses would exit the Terminal from the lower deck.

The lower level ramp entrance would have two lanes and provide AC Transit buses with an inbound and outbound connection to the Terminal's lower bus deck. The upper level ramp entrance would have one lane and provide non-AC Transit buses with inbound access only to the terminal's upper bus deck. Buses exiting from the upper deck would travel down a ramp at the east end of the structure to the AC Transit level and proceed through the AC Transit level to the bus exit.

Buses from the East Bay would gain access to the stacked entrance ramps from the Bay Bridge using an exit at Fremont Street that also serves as a mixed-flow traffic off-ramp. The exit would lead to a two-way single-level bus ramp following the same alignment as the existing ramps. Just before the terminal, the ramp would split into the two levels for entry into either the lower or upper bus levels.

Buses returning to the East Bay would use the two-way single level bus ramp upon exiting from the terminal. At the approach to the Bay Bridge the ramp would split into two levels to connect with the two-level bridge. East Bay buses would follow the eastbound bridge ramp and proceed onto the lower level of the bridge.

Although requiring some future expansion, the ramp connecting the Bay Bridge with the Transbay Terminal would be designed to accommodate the potential implementation of light rail service from the East Bay.

**Bus Access to the Terminal from the Street**. Like the current facility, a direct connection between the Terminal and the surface streets was determined to be unnecessary for bus operations.[32] *S*ome bus service, including paratransit operations, Greyhound, and other private tour operations, would be able *to* access the Transbay Terminal from city streets through the bus storage areas.

**Bus Circulation Inside the Transbay Terminal**. The West Ramp Alternative adds an additional level to the Transbay Terminal's system of bus circulation. AC Transit would board and alight passengers on the lower of the two bus decks (which include the top two levels of the terminal). Buses would circulate clockwise around a central passenger platform using either of

[32] Arup, p. 28

two lanes: one for through traffic and one for turning in and out of the bus bays. The exit for the buses is located adjacent to the terminal entrance on the southwest corner, thus avoiding crossover. The deck would accommodate 30 bays including 26 for articulated buses and 4 for standard buses. The bays would be evenly divided between the northern and southern sides of the central platform. A saw tooth configuration has been adopted in accordance with AC Transit's stated design criteria.

The upper bus deck would be reserved for other transit operators, including Muni's Line 108 to Treasure Island, paratransit services, Greyhound, and private operators. The upper bus deck would accommodate four saw tooth bays and 700 feet of straight curb on the northern side of the terminal – *equal to about 18 additional bus bays.* Buses would circulate along a single-sided passenger platform with two bus lanes: one through-lane and one turnout/parking lane. Unlike the lower level, the upper bus deck circulation is only a half loop, terminating on the east end of the terminal in a ramp that travels back down to the lower bus deck.

The only vertical circulation between the two bus decks is the downward movement from the upper to the lower bus levels on a ramp forming the eastern face of the building. Occasional access from the lower deck to the upper deck would be possible through the external vertical circulation located in the bus storage areas.

**On-Street Bus Circulation Outside the Terminal**. Muni lines 5, 6, 38, and 38L would no longer terminate at the Transbay Terminal's "hump" on Mission Street between First and Fremont Streets. This loading area would be relocated to a mid-block passage under the terminal between Fremont and Beale Streets. *Under this service scenario, Muni buses would operate as they currently do on Market/First and would then make a right turn onto Mission Street. All buses would alight passengers on Mission between First and Fremont Streets. Buses would then continue empty on Mission to Beale and make a right turn and enter the new loading area under the terminal, midblock between Mission and Howard.* Assuming the implementation of a diamond (bus only) lane on Beale Street *South of Mission* Street and through the terminal's designated Muni loading area, the rerouting would add about 40 seconds to the average travel time of buses.[33]

The new loading area would also provide Muni passengers with a direct link to the concourse level of the terminal. Sufficient platform and staging areas would be provided to accommodate Muni's current routes plus at least one addition route. According to a bus operations simulation analysis, there would be excess capacity in two of the four aisles in the mid-block passage. A third aisle reserved for Muni's 38 and 38L would operate near capacity. The fourth aisle, reserved for Golden Gate Transit, would also operate near capacity. Consequently, any

[33] Fehr and Peers Associates, Transbay Terminal Bus Operations Report, (September 2000), p. 10

significant expansions in Muni or GGT capacity would require the staging of buses at an alternate location.[34]

Muni's 14 line would continue to board and alight passengers at surface bus stops along Mission Street. Muni's 10 and 76 lines would continue to load passengers at curbside bus stops along First and Fremont Streets. No significant change in operations would result from the West Ramp Alternative.

*Inbound Golden Gate Transit Basic Service buses, which operate on Mission Street, would continue to terminate in front of the Transbay Terminal on Mission Street. The proposed Transbay Terminal mid-block boarding area would be used as the first revenue stop by outbound GGT Basic Service buses.*

*Inbound Golden Gate Transit Financial District Commute Service buses would continue to serve the Transbay Terminal by the bus stop on First Street, between Market and Mission Streets. Outbound Commute Service would continue to load passengers along Fremont Street between Mission and Market and between Mission and Folsom.*

**Bus Storage Areas**. AC Transit currently stores all of its transbay buses laying over midday in San Francisco on the existing Transbay Terminal access ramps. Under the West Ramp Alternative, minimal bus staging and bus parking would be possible on the new access ramps. Instead, an off-site storage area would be located below the west approaches to the Bay Bridge between Second and Third Streets. Access to the storage area would be by a ramp connection to the two-way Bay Bridge/Transbay Terminal ramp. The area beneath the Bay Bridge is currently used for automobile parking.

AC Transit's bus storage lot would be at-grade with sufficient area to permit parking and circulation in accordance with AC Transit's projected future needs. Depending on the layout and operation of the bus storage area, up to 54 buses could be accommodated at-grade with fully independent access provided each parked bus; another nine buses could be parked on the access ramp. According to a bus operations simulations analysis *developed for the supplemental air quality analysis*, even with assumptions of 50 percent growth in AC Transit service, there would be a maximum of *70* buses (including those circulating) in the storage facility during the *45 minute* peak *period* for bus parking and staging.[35]

Golden Gate Transit buses would be provided bus storage space under the Bay Bridge west approaches between Third and Fourth Streets. Access to the lot would be via the same ramp connection to the AC Transit storage lot and an at-grade mid-block crossing of Third Street.

[34] Fehr and Peers Associates, p. 10

[35] *Supplemental Air Quality Analysis, Terry A. Hayes Associates, LLC, 2003.*

Approximately 140 buses could be accommodated at an at-grade paved lot. It would be occupied by Golden Gate Transit weekdays only and available for other uses in the evening and on weekends.

Approximately 43,000 square feet of space at the western end of the Golden Gate Transit storage area would be available for a single deck parking structure. This would allow approximately 300 public parking spaces to be built contiguous to the storage area.

**Operating Costs**. The annual operating costs for AC Transit would be higher under the West Ramp Alternative than under either the existing operation or the Full Loop Alternative (see below). Table 5.19-2 shows that the estimated annual operational and maintenance costs for AC Transit would be approximately $*1.3* million under the West Ramp Alternative, assuming no growth in service. This is about *40* percent higher than the estimated $939,000 for current AC operations.

**Table 5.19-2: Estimated AC Transit Annual Operating Costs**

| Scenario Increase (Existing) | Operating Costs | Maintenance Costs | Total Costs | % |
|---|---|---|---|---|
| **Existing** | $ 508,972 | $430,285 | $939,257 | |
| **West Ramp Alternative** | *$774,939* | *$530,839* | *$1,305,779* | *39%* |
| **Full Loop Alternative** | *$559,002* | *$455,468* | *$1,014,469* | *8%* |

The cost analysis is based upon AC Transit's 1998-99 cost model, which indicates a marginal cost of $44 per hour and $1.78 per mile.

**Source:** SMWM, Working Paper 4.1 Evaluation of Site Terminal Alternatives, January 2000. Analysis is based on the demand assumptions described in Table 5.19-3.

The cost analysis shown in Table 5.19-2 is based on AC Transit's 1998-99 cost model, which indicates a marginal cost of $44 per hour and $1.78 per mile. The demand assumptions used to determine costs are shown in Table 5.19-3.

*Operating costs for Golden Gate Transit would be lower for both Transbay Terminal options than under the existing conditions, given that the permanent bus storage facility would be closer to the Transbay Terminal than Golden Gate Transit's existing bus storage facility at Eighth and Harrison streets.*

### 5.19.1.2 Full Loop Ramp Alternative

The Full Loop Ramp Alternative would not significantly change existing bus access and circulation between the Transbay Terminal and the Bay Bridge. Although a new terminal facility would be constructed, the location of the new loop ramps between the terminal and the

Bay Bridge would be generally the same. Unlike the West Ramp Alternative, AC Transit bus staging and storage would continue to be on the ramps with some additional off-site parking under the Bay Bridge's western approach at Second Street.

Under the Loop Ramp Alternative, the Transbay Terminal would feature:

- Three center island rail platforms supporting the six future tracks in the basement level. The street level would support patron entry, ticketing, and joint development.
- Street level bus service for Muni and Golden Gate would be provided in the block east of Beale Street (as opposed to the mid-block crossing between Fremont and Beale as proposed in the West Loop Alternative).
- A single elevated bus deck would accommodate the entire AC Transit transbay operation and all other bus services using the direct access ramps to and from the Bay Bridge. A total of 51 bus bays would be served by three one-way bus lanes.

**Terminal Capacity**. The terminal would be designed to accommodate the *35,000* transit passengers expected in the terminal during the peak hour in 2020. A bus operations analysis similar to the one conducted for the West Ramp Alternative was not conducted for the Full Loop Alternative. However, the Full Loop calls for 51 bus bays compared to the West Ramp's *48* bus bays. The latter number was determined to be more than adequate for projected terminal utilization by AC Transit in the foreseeable future.

**Bus Access to the Transbay Terminal from the Bay Bridge**. Under the Full Loop Alternative, bus connections between the Transbay Terminal and the Bay Bridge would be the same as today. There would be no changes in the loop circulation of the existing connecting bus ramps. Westbound buses would exit the Bay Bridge onto a ramp leading directly to the Transbay Terminal, proceed through the east end of the terminal building, and follow the looping ramp above city streets back to the Bay Bridge's approach for eastbound vehicle access

**Bus Access to the Terminal Area from the Street**. The new bus ramps would not require any change in terminal access at street level. However, Muni service currently terminating at the Terminal's "hump" on Mission Street would be relocated to a new staging area east of Beale Street *as in the West Ramp Alternative*.

**Internal Bus Circulation within the Transbay Terminal**. The Transbay Terminal is currently configured with *three* lanes and buses load parallel to the curb. However, to accommodate AC Transit's preferred standard of saw tooth bus bays, the *F*ull *L*oop *A*lternative would have three one-way bus lanes serving 51 bus bays. The bus structure would be somewhat longer than the existing terminal to accommodate the increased number of bays and the reduced number of lanes.

**On-Street Bus Circulation**. Muni lines 5, 6, 38 and 38L would board and alight passengers at a new loading area east of Beale Street and north of Howard Street. *As with* the West Ramp Alternative, buses would need to continue two extra blocks along *Mission* Street to access the terminal area through Beale Street. There would not be substantial changes in the existing on-street circulation of Golden Gate Transit and SamTrans under the Full Loop Alternative.

**Bus Storage**. AC Transit buses would continue to be staged on the ramps with parking available on the east side of the ramps. Additional storage for both AC Transit and Golden Gate Transit would be available beneath the western approach of the Bay Bridge at Second Street.

**Operator Costs**. As shown in Table 5.19-2, operating and maintenance costs for AC Transit would not be significantly higher under the Full Loop Alternative than under the existing situation. Combined annual costs would be approximately $*1.01*million or 8 percent higher than the $939,000 required for existing operations.

*Operating costs for Golden Gate Transit would be lower for both Transbay Terminal options than under the existing conditions, given that the permanent bus storage facility would be closer to the Transbay Terminal than Golden Gate Transit's existing bus storage facility at Eighth and Harrison streets.*

### 5.19.1.3 Intermodal Connectivity

**Mezzanine**. The West Ramp *and* Loop Ramp Alternatives would include a below-grade mezzanine. The mezzanine would be constructed between the terminal's ground floor and the rail platforms. Its configuration would consist of a simple bridge spanning across the platforms or a large floor area. The mezzanine would allow consolidation of the vertical circulation elements down from ground level and greatly increase the flexibility of the ground floor layout.

A rail mezzanine would enable escalator access between the upper bus decks, the street-level Muni loading area, and below ground rail platforms. The mezzanine could also facilitate a direct underground connection between the western end of the Transbay Terminal and a proposed Muni Third Street light rail station. By situating this connection at an underground mezzanine instead of along raised platforms of an on-street alignment, pedestrian movements would not be disrupted on the aboveground street grid (see Section 5.21.4).[36] The mezzanine would have no adverse effects on bus operations in the terminal or at street level.

**Pedestrian Tunnel between Transbay Terminal and Market Street.** The option for a pedestrian tunnel to Market Street under both terminal design alternatives would create a passageway between the Terminal and the Market Street subway. For either terminal alternative, the connection would be built below Fremont Street, providing a sheltered passenger connection

[36] SMWM Working Paper 12 Terminal Design Modifications and Refinements, (March 2001), p. 40.

between AC Transit bus service, Caltrain, Greyhound and the Muni/BART underground rail lines. The pedestrian tunnel is not anticipated to affect bus operations substantially although there is the potential for street bus movements, as for street traffic, to experience fewer conflicts and delays at intersections from reduced pedestrian volumes at crosswalks.

### 5.19.2 Impacts on Corridor Transit Patronage

The Transbay Terminal/Caltrain Downtown Extension Project would increase linked transit trips in the region in the year 2020 by an estimated 10,000 trips per day, from about 728,000 to 738,000 trips per day. As defined for this project, a linked transit trip consists of two or more unlinked trips, i.e., transit trips that involve two or more vehicles or modes. Thus an increase in linked transit trips in the corridor indicates that more people are choosing to use Caltrain instead of non-transit modes, compared with the No-Project Alternative.

Preliminary estimates of the transit mode shares have been made. The current transit mode share for work trips between San Mateo County and San Francisco is estimated to be 15.4 percent. Between Santa Clara County and San Francisco, the transit mode is estimated to be 13.1 percent. By 2020, these transit mode shares are expected to rise to 19.7 and 22.3 percent, respectively. With the Terminal/Extension Project, these transit mode shares are projected to be 22.2 and 28.5 percent, respectively.

### 5.19.3 Impacts on Other Transit Services

The Caltrain Extension would provide a terminus that is in downtown San Francisco and the Financial District. Current bus shuttles between these areas and the existing Caltrain terminus at Fourth and Townsend Streets would be eliminated or rerouted, with possible corresponding reductions in Muni's operating costs. With the extension, Caltrain would also provide better service to downtown San Francisco for some trip makers than would BART and SamTrans, with attendant patronage impacts on these systems. The Caltrain Extension would also have long-term impacts on transit services that currently utilize the Transbay Terminal.

#### 5.19.3.1 BART

Ridership forecasts predict that the Transbay Terminal/Downtown Caltrain Extension Project would result in a *11* percent reduction in BART entries and exits in San Mateo County (at the Daly City, Colma, Hickey, Tanforan, SFO, and Millbrae BART stations). The analysis indicates that in 2020, there would be about 5,700 daily transfers between BART and Caltrain at the Peninsula intermodal transfer facility in Millbrae under the No-Build Alternative, and that this number would drop by about 4,400 (78 percent) if Caltrain were extended into downtown San

Francisco. An additional 700 transfers per day between BART and Caltrain is projected to occur in downtown San Francisco under the Terminal/Extension Project.

### 5.19.3.2 Muni

The following assumptions about Muni bus route changes with the Caltrain Extension Alternative were made:

- *Regarding the 30-Stockton and 45-Union, one of these will continue to serve Third and Fourth Streets between Market and Townsend, and will be extended into Mission Bay. The other will likely be terminated in the vicinity of Yerba Buena Center.*
- The 10 Townsend/47 Van Ness- would be rerouted to run along Harrison Street and Bryant Street between Fifth Street and Main Street.
- The 76-Marin Headlands and the 82X-Levi Plaza Express would be truncated and rerouted to serve the Transbay Terminal area.

The changes in Muni service are predicted to result in a reduction in annual revenue-hours and revenue-miles for Muni of 15,700 hours and 151,100 miles, respectively, resulting in an annual net cost savings of about $1.4 million. Muni would also reduce its peak fleet demand by four buses. In addition to re-routing existing Muni service to Caltrain's Fourth and Townsend Streets terminal, the existing Muni shuttle service (81x, 80x) to the Caltrain terminal could be eliminated saving the JPB approximately $558,000 for Muni shuttle service savings per year. Muni Metro N-Judah LRT service to Fourth and King Streets is assumed to continue to service to all stops south of the Embarcadero Station, including the reconfigured Caltrain station and the Third Street LRT extension, which is currently under construction.

*Ridership forecasts predict that the Transbay Terminal/Downtown Caltrain Extension Project would result in a four percent decrease in Muni ridership.*

### 5.19.3.3 SamTrans

The extension of Caltrain would also decrease the need for SamTrans express bus service from the Peninsula to the Transbay Terminal. SamTrans express routes including the KS, MX, NX, PX, RX, and TX would likely be eliminated. Consequently, the extension of Caltrain into downtown is projected to result in a reduction of 2,000 passengers in SamTrans daily bus ridership where a SamTrans bus was the primary mode of travel. Trips that use a SamTrans bus to gain access to a Caltrain or BART station are not included in this estimate. Additionally, local SamTrans routes would continue to serve downtown San Francisco in the Transbay Terminal area. This reduction in service would decrease SamTrans annual revenue-hours and revenue-miles by 16,500 hours and 405,200 miles, respectively. SamTrans would also require 32 fewer buses during the peak periods of operation. This would result in a $2.6 million reduction in annual operating and maintenance costs for Sam Trans.

*Ridership forecasts predict that the Transbay Terminal/Downtown Caltrain Extension Project would result in a three percent reduction in SamTrans bus ridership.*

#### 5.19.3.4 AC Transit

*A substantial change in AC Transit ridership was not projected by the model for the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project, although some increase in ridership is predicted due to the complementary nature of the Downtown Caltrain Extension.* Extending Caltrain to the Transbay Terminal would likely encourage transfers from Caltrain to AC Transit buses, thereby increasing AC Transit bus ridership *somewhat.*

#### 5.19.3.5 Golden Gate Transit

*A substantial change in ridership on Golden Gate Transit was not projected by the model for the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project, although the increased proximity of the Caltrain terminal to Golden Gate Transit bus routes could increase the number of transfers from Caltrain to Golden Gate buses, thereby increasing Golden Gate bus ridership.*

*The proposed permanent off-site storage facility for Golden Gate Transit bus operations beneath the Western Approach of the Bay Bridge would be closer to the Transbay Terminal than Golden Gate Transit's existing bus storage facility at Eighth and Harrison streets. This will result in reduced deadheading and operating costs for Golden Gate Transit buses that layover at the storage facility between runs.*

#### 5.19.3.6 Other Transit Operators

*Ridership forecasts predict that VTA ridership would decrease by two percent. However,* Greyhound and other operators in the Transbay Terminal could potentially have their ridership enhanced by the closer connection with Caltrain.

### 5.19.4 Impacts on Vehicular Traffic

#### 5.19.4.1 Travel Time Impacts in Caltrain Corridor

The ridership analysis projected that the Terminal/Extension Project would have a beneficial impact on traffic congestion. In every case, auto travel times in the A.M. peak period are expected to decrease under the Terminal/Extension Project. In 2020, the travel time improvements between origins in the U.S. 101 corridor and San Francisco are expected to

typically be from two to four minutes[37]. Relocating Caltrain's San Francisco terminus to the Transbay Terminal area is expected to result in a seven percent reduction in the number of person hours of vehicle travel.[38] Morning peak hour delay is expected to be reduced by 20 percent. Implementation of the Terminal/Extension Project would result in daily travel time savings of 7,200 person hours, which includes 5,700 person hours saved for Caltrain riders and 1,500 person hours for roadway travelers in the corridor. Using FTA procedures, this represents an approximate $20 million per year savings (7,200 hours/day X $11.26/hour X 250 work days/year).

### 5.19.4.2 Vehicle Miles Traveled (VMT) Impacts in the Caltrain Corridor

Year 2020 vehicle miles traveled (VMT) on all roadways in the corridor is projected to decrease by 0.2 percent from 145,934,000 to 145,674,000 VMT, a savings of 260,000 VMT with the Terminal/Extension Project compared with the No-Project conditions

### 5.19.4.3 Intersection Level of Service Impacts around the Transbay Terminal

The San Francisco County Transportation Authority (SFCTA) countywide travel demand forecasting model (SFCTA Model) was used to develop the travel forecasts for development and growth through the year 2020 in the region, as well as to determine travel demand to and from the South of Market area (area roughly bounded by The Embarcadero, Market Street, South Van Ness Avenue and King Street). This approach results in an impacts assessment for year 2020 conditions that takes into account both the future development expected in the South of Market area, as well as the expected growth in housing and employment for the remainder of San Francisco and the nine-county Bay Area. The most up-to-date version of the SFCTA Model estimates future traffic and transit travel demand for the entire nine-county Bay Area region based on land use and employment forecasts prepared by the San Francisco Planning Department for the county, plus regional growth estimates developed and adopted by the Association of Bay Area Governments (ABAG) in 1998 (Projections '98) for the remainder of the Bay Area region. Travel demand was estimated for three land use scenarios:

- **2020 No-Project**, which assumed future development and growth, consistent with the ABAG forecasts for San Francisco and the Bay Area, and incorporates projects that have recently been approved or entitled in the South of Market area.

- **2020 Project**, which included the additional development associated with the Terminal/Extension Project.

[37] Ridership Forecasting Results Report, Korve Engineering, Inc., May 29, 1996. Adjusted to 2020 conditions by PTG, September 2001.

[38] August 27, 1996 memo from Korve Engineering to ICF Kaiser Engineers.

- **2020 Cumulative**, which incorporated other plans recently proposed in the South of Market area including the Rincon Hill Rezoning and the South of Market Redevelopment Area Plan, the Mid-Market Redevelopment Area Plan, as well as the Transbay Terminal / Downtown Caltrain Extension Project. As a result, the year 2020 cumulative conditions forecasts used in the analysis exceed the ABAG forecasts for San Francisco for employment by about 2.8 percent, and household population by about 1.4 percent.

An analysis for adverse effect from the project's impact to intersections within the project area was performed for the existing plus project and cumulative conditions. Table 5.19.3 shows all intersections with an adverse effect and notes all intersections that have a level of service (LOS) of E or F under the existing plus project and cumulative conditions (see also Table 5.19-4). *Under the City and County of San Francisco criteria, an adverse effect would occur if an intersection is degraded to a LOS of E or F. For an intersection that operates at LOS E or F in the without project conditions, there may be an adverse impact depending upon the magnitude of the project's contribution to the worsening of delay. In addition, a project would have an adverse effect if it would cause major traffic hazards, or would contribute considerably to the cumulative traffic increase.* For the purpose of this project, existing conditions are assumed to be year 2020 baseline, existing plus project is the 2020 baseline plus the Transbay Terminal project, and cumulative is the cumulative that includes all of the related City and Redevelopment projects.

**Table 5.19-3: Project Impact Determination for Intersections at LOS E or F Under *2020 Baseline* Plus Project and *2020* Cumulative Conditions**

| Intersections | *2020 Baseline* Plus Project | *2020* Cumulative |
|---|---|---|
| First/Market | Adverse Effect | Adverse Effect |
| First/Mission | Adverse Effect | Adverse Effect |
| First/Howard | Adverse Effect | Adverse Effect |
| Fremont/Howard | Adverse Effect | Adverse Effect |
| Beale/Howard | Adverse Effect | Adverse Effect |
| Second/Folsom | Adverse Effect | Adverse Effect |
| First/Folsom | Not an Adverse Effect | Not an Adverse Effect |
| The Embarcadero/Folsom | Not LOS E or F under Existing Plus Project | Not an Adverse Effect |
| Second/Harrison | Not an Adverse Effect | Not an Adverse Effect |
| Harrison/Essex | Not an Adverse Effect | Not an Adverse Effect |
| Harrison/First | Not an Adverse Effect | Not an Adverse Effect |
| Harrison/Fremont | Not an Adverse Effect | Not an Adverse Effect |
| Main/Harrison | Not an Adverse Effect | Not an Adverse Effect |
| Second/Bryant | Adverse Effect | Adverse Effect |

**Source: San Francisco Planning Department, January 2002.**

**Table 5.19-4: Intersection Level of Service -- Existing and 2020 Conditions, Weekday P.M. Peak Hour**

| Intersection | Existing | | | 2020 No-Project | | | 2020 Term./Ext. Project | | | 2020 Cumulative | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Delay | LOS | v/c | Delay | LOS | v/c | Delay | LOS | v/c | Delay | LOS | v/c |
| 1. First/Market | 25.9 | D | – | 34.9 | D | – | 54.9 | E | 1.16 | >60 | F | 1.17 |
| 2. Fremont/Market | 15.2 | C | – | 26.0 | D | – | 30.3 | D | – | 34.4 | D | – |
| 3. Second/Mission | 10.2 | B | – | 16.1 | C | – | 21.1 | C | – | 31.6 | D | – |
| 4. First/Mission | 27.1 | D | – | 58.5 | E | 1.13 | >60 | F | 1.22 | >60 | F | 1.22 |
| 5. Fremont/Mission | 21.8 | C | – | 21.9 | C | – | 29.2 | D | – | 30.5 | D | – |
| 6. Beale/Mission | 14.9 | B | – | 19.9 | C | – | 33.0 | D | – | 33.0 | D | – |
| 7. Main/Mission | 15.6 | C | – | 20.3 | C | – | 22.6 | C | – | 26.6 | D | – |
| 8. Second/Howard | 15.1 | C | – | 25.9 | D | – | 25.1 | D | – | 27.3 | D | – |
| 9. First/Howard | 31.9 | D | – | 40.9 | E | 1.09 | >60 | F | 1.21 | >60 | F | 1.24 |
| 10. Fremont/Howard | 20.1 | C | – | 28.7 | D | – | 44.3 | E | 1.03 | 42.4 | E | 1.03 |
| 11. Beale/Howard | 16.2 | C | – | 28.1 | D | – | >60 | F | 1.19 | >60 | F | 1.21 |
| 12. Main/Howard | 15.4 | C | – | 25.1 | D | – | 33.7 | D | – | 39.6 | D | – |
| 13. Spear/Howard | 13.9 | B | – | 15.5 | C | – | 31.7 | D | – | 33.7 | D | – |
| 14. Second/Folsom | 32.5 | D | – | >60 | F | 1.15 | >60 | F | 1.18 | >60 | F | 1.24 |
| 15. First/Folsom | >60 | F | 1.17 | >60 | F | 1.15 | >60 | F | 1.21 | >60 | F | 1.24 |
| 16. Fremont/Folsom | 7.7 | B | – | 22.4 | C | – | 25.5 | D | – | 26.8 | D | – |
| 17. Beale/Folsom | 14.5 | B | – | 14.7 | B | – | 15.8 | C | – | 15.8 | C | – |
| 18. Main/Folsom | 12.1 | B | – | 15.9 | C | – | 34.6 | D | – | 34.1 | D | – |
| 19. Spear/Folsom | 11.1 | B | – | 13.2 | B | – | 14.1 | B | – | 16.5 | C | – |
| 20. The Embarcadero/Folsom | 18.2 | C | – | 26.5 | D | – | 39.0 | D | – | 47.5 | E | 0.95 |
| 21. Second/Harrison | 44.9 | E | 1.11 | >60 | F | 1.19 | >60 | F | 1.26 | >60 | F | 1.32 |
| 22. Essex/Harrison | >60 | F | 1.15 | >60 | F | 1.17 | >60 | F | 1.18 | >60 | F | 1.19 |
| 23. First/Harrison | >60 | F | 1.26 | >60 | F | 1.23 | >60 | F | 1.29 | >60 | F | 1.33 |
| 24. Fremont/Harrison | 36.2 | D | – | 49.5 | E | 0.93 | 59.1 | E | 0.96 | >60 | F | 0.99 |
| 25. Main/Harrison | 32.0 | D | – | 40.9 | F | 0.83 | 56.1 | F | 0.89 | >60 | F | 0.95 |
| 26. Spear/Harrison | 15.4 | C | – | 30.4 | C | – | 31.9 | D | – | 37.0 | D | – |
| 27. Second/Bryant | >60 | F | 1.18 | >60 | F | 1.23 | >60 | F | 1.28 | >60 | F | 1.31 |

**Notes:** Delay presented in seconds per vehicle. v/c = volume-to-capacity ratio for all intersections at LOS E or F.
**Source: Wilbur Smith Associates, December 2001**

*2020* **Baseline Plus Project Conditions.** As shown in Table 5.19-4, the project's traffic contribution to the following intersections would be considered **not adverse** under the baseline plus project conditions:

- First/Folsom
- Second/Harrison
- Harrison/Essex
- Harrison/First
- Harrison/Fremont
- Main/Harrison

This was determined based on an examination of the traffic volumes for the traffic movements that determine overall LOS performance at these intersections. In most intersections where baseline plus project conditions were found to be not adverse, the project would add traffic movements that would continue to operate satisfactorily. In some instances, the project would add vehicles to movements at intersections that would not perform well under the 2020 baseline plus project conditions. However, in these instances, the project's contributions to these movements would be small. Finally, in one case, no adverse contribution was found because the project volumes and total volumes for the movement would be very small and would not materially affect the overall LOS performance at the affected intersection. For the intersections listed above, project traffic would also not represent a considerable contribution to the *2020* baseline plus project conditions, and the project would not have an adverse traffic impact at these intersections.

As shown in Table 5.19-4, the project's contribution to the following intersections would be considered **adverse** under the *2020* baseline plus project conditions:

- First/Market
- First/Mission
- First/Howard
- Fremont/Howard
- Beale/Howard
- Second/Folsom and
- Second/Bryant

The project would add substantial numbers of vehicles to some movements that determine overall LOS performance. Specifically, the project would add vehicles to movements that represent a considerable contribution to the baseline plus project traffic conditions and the project would have an adverse impact on these intersections.

***2020* Cumulative Condition**: As shown on Table 5.19-4, the *project's* traffic contribution to the following intersections would be considered **not adverse under *2020* cumulative conditions**.

- First/Folsom
- Second/Harrison
- Harrison/Essex
- Harrison/First
- Harrison/Fremont
- Main/Harrison

This was determined based on an examination of the traffic volumes for the traffic movements that determine overall LOS performance at these intersections. In most instances where cumulative conditions were found to be not adverse, the project would add vehicles to movements that would continue to operate satisfactorily. In some instances, the project would add vehicles to movements at intersections that would not perform well under cumulative conditions. However, in these instances, the project's contribution to these movements would be small. Finally, in one case, no adverse contribution was found because the project volumes and total volumes for the movements would be very small and would not materially affect overall LOS performance at the affected intersection. For the intersections listed above, project traffic would not represent a considerable contribution to the cumulative conditions, and the project would not have an adverse traffic impact at these intersections.

As shown in Table 5.19-4, the project's contribution to the following intersections would be considered **adverse under *2020* cumulative conditions** *(these are the same intersections that would experience adverse effects under the 2020 plus project condition)*:

- *First/Market*
- *First/Mission*
- *First/Howard*
- *Fremont/Howard*
- *Beale/Howard*
- *Second/Folsom and*
- *Second/Bryant*

For these intersections, the project would add substantial numbers of vehicles to some movements that determine overall LOS performance. Therefore, the project would add vehicles to those movements that would represent a considerable contribution to the cumulative conditions and the project would have an adverse impact on these intersections.

The Terminal/Extension Project would result in a substantial increase in vehicle trips to and from new developments, particularly in the area bounded by Mission, Folsom, First and Main Streets. Along First and Howard Streets there is a high volume of traffic destined to the I-80/Bay Bridge on-ramp at First/Harrison and to the U.S. 101 southbound on-ramp at Fourth/Harrison (via Howard and Fourth Streets) to which the Terminal/Extension Project would contribute additional

vehicles and result in increased congestion. Similarly, the planned modifications to the I-80 westbound off-ramp at Fremont Street would add a second leg that will provide access to Folsom Street and result in an increase in vehicles on Folsom Street. The combined increase in vehicles on Folsom Street due to the modified ramp and vehicle-trips generated by the Terminal/Extension Project would result in LOS E conditions at the intersection of The Embarcadero/Folsom Street.

**Mitigation:** The Project would result in adverse impacts at seven intersections under both the baseline plus project and cumulative conditions. Improvements at individual intersections may *reduce* localized congestion *somewhat*, but may not mitigate operating conditions to less than adverse levels. As a result of the constraints at downstream intersections and the I-80/U.S. 101 on-ramps and mainline, mitigation measures for the seven intersections have not been proposed, and the impacts associated with the Project would be considered adverse and unmitigable.

*T*o help improve 2020 Cumulative operating conditions, the San Francisco Department of Parking and Traffic (DPT) may request sponsors of development projects in the South of Market area to contribute to the new Integrated Transportation Management System (ITMS) program. This program is a citywide real-time electronic transportation management system that would include the installation of various Intelligent Transportation System (ITS) infrastructure components to improve traffic circulation within the City. The program would monitor and manage traffic by receiving real-time information at a Traffic Management Center via closed circuit TV cameras. The South of Market area has been identified as the area within which the first phase of the system would be implemented.

The implementation of the ITMS program would improve overall traffic conditions and reduce traffic congestion in the City. Although the implementation of ITMS may not directly mitigate the adverse impacts of the Project under 2020 Terminal/Extension Project conditions or 2020 Cumulative conditions, this program would result in overall traffic improvements and lessening of congestion, and would facilitate traffic circulation in the South of Market area.

#### *5.19.4.4 Traffic Impacts Associated with Draft Transbay Redevelopment Project Area Design for Development Vision*

*To account for the increased demand for pedestrian and bicycle facilities with the new Transbay Terminal and the new development throughout the Transbay Area, the San Francisco Redevelopment Agency has developed a Draft Transbay Redevelopment Project Area Design for Development Vision (August 2003) that includes proposed sidewalk widenings with corresponding reduction in the adjoining street widths (as described in Section 2.2.4.2 of the Final EIS/EIR). This section reviews the traffic impacts associated with the sidewalk widening proposals.*

*To accomplish this review, the results of the traffic analysis described in the previous section were reevaluated for the 2020 Cumulative conditions. For each of the analysis intersections, the weekday P.M. peak hour intersection operating conditions were examined to see if it would be possible to reduce the number of travel lanes and still maintain acceptable operating conditions*

*(i.e., LOS D or better). In addition, the actual configuration of the streets was investigated to identify locations where: (A), lane imbalances were present (i.e., a street with two lanes on one side of an intersection and three lanes on the other side); (B), perpendicular/diagonal parking could be converted to parallel parking; or (C), turn lanes could be converted into turn pockets. Although these changes would not result in the complete elimination of travel lanes, they would allow for wider sidewalks to be created for portions of the streets. As part of this analysis, no changes were proposed or evaluated at intersections that were projected to operate with unacceptable conditions (i.e., LOS E or F) during the weekday P.M. peak hour.*

*For the major vehicular corridors in the study area (such as Folsom, Howard, Fremont, First and Essex Streets), the potential to establish peak-period tow-away lanes was assessed. Since these streets accommodate substantial traffic during the morning and evening commute periods, it may be possible to eliminate travel lanes during off-peak times. As a result, the current capacity would be maintained during the weekday P.M. peak hour, and would not change the intersection operating conditions, but additional sidewalk space could be created.*

*In addition, the potential to extend westbound Folsom Street was assessed. Based on the projected weekday P.M. peak hour intersection operating conditions, it would be possible to extend westbound Folsom Street for two blocks (from Main Street to Fremont Street) and maintain acceptable intersection operating conditions.*

*Following are changes that could be made to the street network within the Transbay Area that are not anticipated to introduce new adverse traffic impacts.*

***Spear Street** has two lanes southbound between Market Street and Howard Street. South of Howard Street, it widens to three lanes and continues as three lanes until Harrison Street. It would be possible eliminate a travel lane between Howard Street and Harrison Street, as long as three lanes are provided at the intersection with Harrison Street. The southbound left-turn pocket at the intersection of Spear/Harrison would need to be about 150 feet long.*

*North of Folsom Street, **Main Street** has three northbound lanes. It would be possible to narrow Main Street to two lanes at the north side of the intersection with Folsom Street, as long as three lanes were maintained at the intersection with Howard Street. The northbound left-turn pocket at the intersection of Main/Howard would need to be about 175 feet long.*

*Between Mission Street and Folsom Street, **Beale Street** has three southbound lanes. These lanes need to be maintained.*

*During the peak morning and evening commute periods, the current configuration of **Fremont and First Streets** would need to be maintained. During the off-peak hours, it would be possible to reduce the number of travel lanes on each street. As a result, peak period tow-away lanes could be established on one side of the street. A peak-period tow-away lane on Fremont Street was found not to be feasible due to the configuration of the street and the various lane requirements.*

*Between Harrison and Folsom Streets,* ***Essex Street*** *has two northbound and two southbound lanes. It would be possible to eliminate one northbound lane. In addition, it would be possible to establish a peak period tow-away lane in the southbound direction.*

*Between Main Street and The Embarcadero,* ***Folsom Street*** *has three eastbound lanes and one westbound lane. To the west of Main Street, Folsom Street has four eastbound lanes. Between Fremont Street and Main Street, it would be possible to eliminate one eastbound lane and establish a new westbound lane (an extension of the current two-way street for an additional two blocks). It should be noted that the infrastructure for this conversion to two-way traffic would be associated with the temporary terminal project.*

***Howard Street*** *has two lanes between Fremont Street and The Embarcadero in the eastbound direction. For this entire length, only one eastbound lane would be necessary, except at the intersection with Main Street. At this location, an eastbound left-turn pocket would need to be provided.*

### 5.19.5 Impacts on Parking

A portion of the existing public and private parking facilities (parking lots) in or near the existing Transbay Terminal would be eliminated as a result of the Full Build Alternative. Approximately 1,950 (14 percent of study area parking) off-street parking spaces would be eliminated, including 260 spaces within the current Transbay Terminal building. Although the Full Build Alternative would eliminate off-street parking, new land use in the Transbay Terminal Redevelopment Area would have its own parking facilities.

With the loss of parking, vehicles previously bound for the displaced parking spaces would have to park in other parking facilities nearby or the people making these trips may now chose to use transit, given the reduced availability of parking, *and enhanced accessibility of transit services.*

Based on a review of a recent parking inventory, the current study area parking supply is at approximately 85 percent capacity during the weekday-midday. As a result of the reduction in parking spaces, usage is likely to reach capacity during the weekday midday. Given the first-in first-served nature of parking, with early morning commuters able to park closer to their destination, loss of area parking would mean that vehicles arriving later would have to park farther away from their destinations or chose another mode of transportation. The permanent loss of parking could deter commuters from driving, with a probable increase in public transit use. The provision of a new multi-modal transit facility that provides improved access to locations throughout the region would serve to mitigate the adverse parking capacity impacts.

The displacement of parking spaces is not generally considered a physical environmental effect but is a social effect and an inconvenience to those who must seek other parking. The displacement of parking spaces and any resulting parking deficits are also not considered to be a permanent condition as drivers my be induced to seek and find alternative parking facilities and shift to other modes of travel.

### 5.19.6 Non-Motorized Traffic Impacts

This section reviews the long-term effects of Terminal/Extension Project on pedestrian and bicycle conditions in the area surrounding the Transbay Terminal. *It should be noted that the following analysis did not take into account the proposed sidewalk widenings contained in the Draft Transbay Redevelopment Project Area Design for Development Vision released by the San Francisco Redevelopment Agency in August 2003. Implementation of any or all of the proposed sidewalk widenings would result in improved pedestrian capacity and flows in the area. Thus, the following analysis reports "worst-case" conditions.*

#### 5.19.6.1 Pedestrian Impacts

Impacts on pedestrians were evaluated by modeling peak period walk trips with and without the Terminal/Extension Project and calculating pedestrian level of service at five intersections in the vicinity of the proposed new Transbay Terminal, which is the main area of pedestrian activity associated with the project.

Baseline surveys of existing pedestrian volumes were made in spring 2001 and future (2020) volumes projected based upon the level of transit and retail/commercial/other activity anticipated in the area. Two project alternatives were considered (1) no pedestrian tunnel between the terminal and Market Street and (2) a direct underground pedestrian tunnel connecting the Caltrain platform or mezzanine area with the BART/Muni mezzanine under Market Street.

The model is the San Francisco Transportation Authority travel model, modified to include assignment of future walk trips generated by increased transit access and higher land use densities from redevelopment. The study area was divided into various analysis zones, as shown in Figure 5.19-1. The modified model predicts pedestrian trips among the analysis zones that have the potential to generate pedestrian traffic and assigns them to certain pathways along city streets and through intersections. The baseline surveys provide a measure for calibrating estimated future pedestrian volumes and movements to ensure they are reasonable.

Projected pedestrian volumes moving through a crosswalk translate to an estimate of the surface square footage available to each pedestrian and expected pedestrian flow rates (pedestrians per minute per foot). Level of service (LOS) is based upon the estimated space per pedestrian and a corresponding flow rate during the peak 15 minutes of pedestrian activity. Levels of service criteria are drawn from the Highway Capacity Manual (Transportation Research Board, Chapter 13). Similar to traffic, a pedestrian volume-to-walkway capacity relationship can be derived. A pedestrian volume to walkway capacity ratio of 0.40 to 0.28 equates to LOS C, for instance; a V/C ratio of 1.00 or higher equates to LOS F. The corresponding square footage per pedestrian under LOS F is 6 or less, and the average pedestrian flow rate is 25 or more pedestrians per minute per foot.

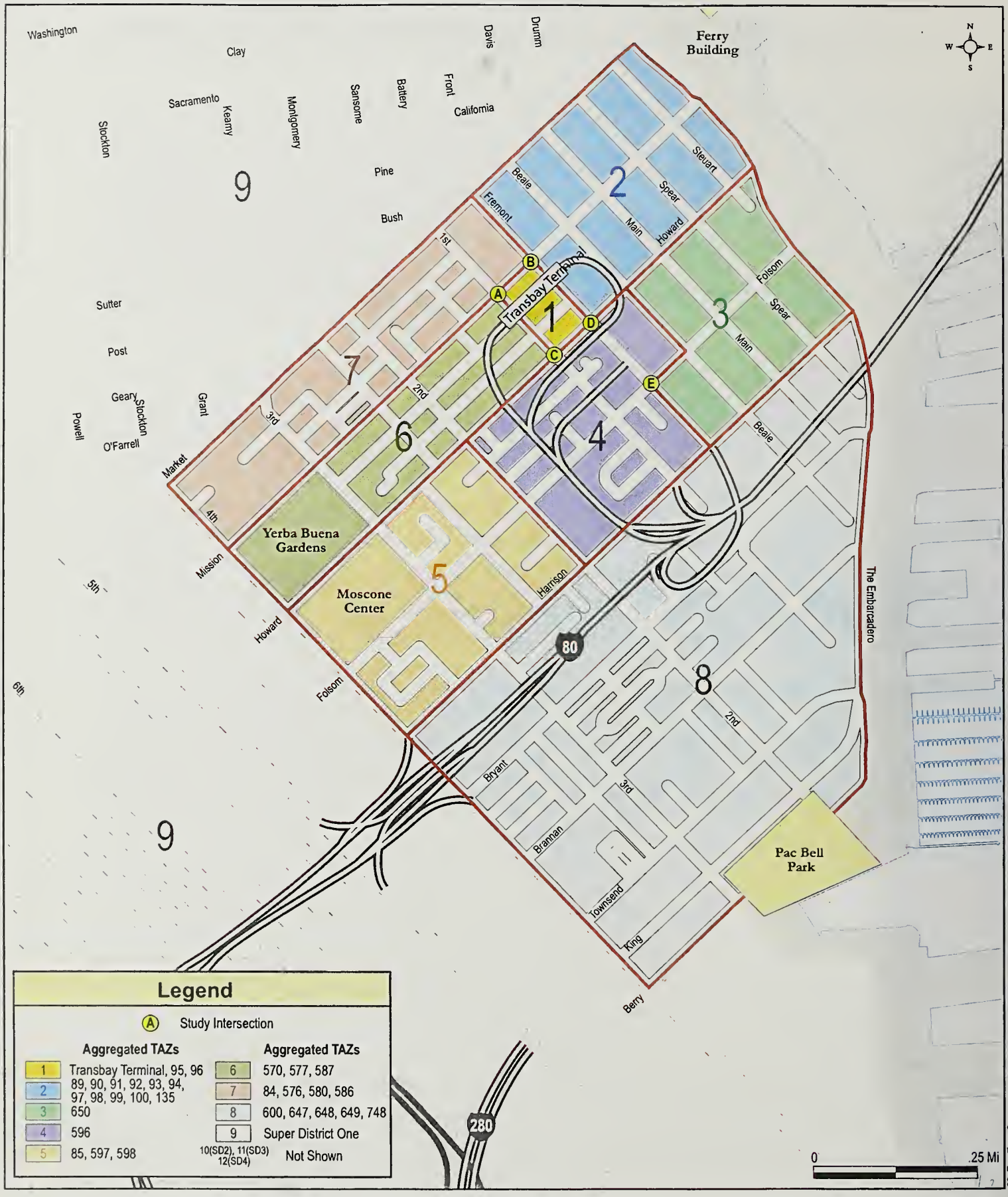



Figure 5.19-1 Aggregated TAZs used for Pedestrian/Bicycle Analysis

The five study area intersections where crosswalk LOS was evaluated are:

- Mission and First Streets
- Mission and Fremont Streets
- Howard and First Streets
- Howard and Fremont Streets
- Folsom and Beale Streets

Important parameters affecting pedestrian volumes in the study area are such items as the access mode splits for Caltrain, AC Transit and other transit riders, peak hour mode shares, increased street activity from redevelopment. Several important assumptions for the 2020 P.M. peak hour pedestrian forecasts are:

- 80 percent walk access for Caltrain riders commuting to San Francisco[39]
- 50 percent walk access for Caltrain riders reverse commuting to points south[40]
- 83 percent walk access for AC Transit riders[41]
- Substantial increases in background pedestrian traffic due to both continuing growth in the area and growth due to redevelopment.

**2020 Pedestrian Volumes and LOS, Background Plus Project (Total Traffic).** As a result of continuing growth in the study area and as a result of the proposed project improvements, pedestrian trips are projected to increase 59.5 percent between 2000 and 2020 in the analysis zones surrounding the Transbay Terminal. At the five individual study area intersections, where pedestrian activity or growth in activity would be concentrated, the percentage increases in pedestrian traffic during the P.M. peak hour would be substantially greater, from 300 percent to over 2000 percent, depending upon location.

All pedestrians are assumed to use surface streets to move among analysis zones, including through the five study area intersections evaluated. The total pedestrian counts for 2001 and the projected volumes under the background plus project scenario for 2020 are shown in Table 5.19-5. The volumes are for the 15-minute p.m. peak window of highest pedestrian activity.

[39] Source: Nelson\Nygaard Consulting: Based on existing mode split at the Fourth and Townsend Station (Source Parsons Transportation Group) and existing mode split at the Transbay Terminal (Source: May 2001 Transbay Terminal Patron Survey conducted by Nelson\Nygaard). Assumes that once Caltrain is extended to the Transbay Terminal, the walk split would increase from the existing condition at Fourth and Townsend to almost equal to that *of* AC Transit Transbay Terminal Patrons.

[40] Source: Based on the existing Caltrain mode splits at Fourth and Townsend Station and the assumption that the walk mode in the reverse commute direction would increase substantially if the Terminal station were moved.

[41] Source: Nelson\Nygaard Consulting, Transbay Terminal Spring 2001 patron survey.

**Table 5.19-5: Pedestrian per Intersection: 2001 and 2020 Baseline Plus Project**
(15-minute P.M. Peak Total Pedestrian Traffic)

| Intersection | May 2001 Pedestrians | % Increase by 2020 | Increase Due to Area Growth & Redevelopment | Increase Due to AC/Caltrain | 2020 Total Peds/Intersection[1] |
|---|---|---|---|---|---|
| Mission & First | 895 | 915% | 8,185 | 454 | 9,534 |
| Mission & Fremont | 854 | 380% | 3,247 | 141 | 4,243 |
| Howard & First | 228 | 2182% | 4,967 | 294 | 5,489 |
| Howard & Fremont | 235 | 1765% | 4,141 | 70 | 4,446 |
| Folsom & Beale | 117 | 839% | 982 | 12 | 1,111 |

[1] Existing plus increase due to area growth and redevelopment and increase due to AC/Caltrain.

The percentage increases in pedestrian volumes due to area growth and redevelopment are high because they represent the change over a 20-year period. Pedestrian volumes in the area are anticipated to increase markedly with or with*out* the proposed project and additional redevelopment efforts. In addition, the current pedestrian volumes upon which the percentage change is based are quite small in many cases.

**Intersection LOS.** When a pedestrian arrives at a particular intersection, he or she may use a variety of combinations and crosswalks to move through the intersection. For example, at the first study intersection, Mission and First Streets, the May 2001 field survey showed that 895 pedestrians made 1,945 "movements" through the intersection. A movement is considered entering or exiting a crosswalk or turning the corner.

Pedestrian LOS accounts for all movements that pedestrians make through an intersection. Figure 5.19-2 shows pedestrian LOS associated with the pedestrian volumes and LOS summarized in Table 5.19-6. As shown, pedestrian LOS is projected to be poor, varying from LOS E to F, at four of the five intersections evaluated by 2020, with continuing growth in the area and as a result of project generated pedestrian activity.

**Changes to Pedestrian LOS Due to Project Impacts Only.** Not all of the increase in pedestrian activity listed in Table 5.19-6 is attributable to the Transbay Terminal/Caltrain Downtown Extension Project, including area redevelopment. A considerable increase in pedestrian movements results from area growth between 2001 and 2020.

According to output from the SFTA model, about seven percent of the increase in total pedestrian volumes by 2020 actually would be generated by the project (9,482 of 140,845 pedestrian trips among the traffic analysis zones analyzed). Following a similar methodology as that used to estimate total pedestrian trips from all sources, the impacts of just the project were estimated. Intersection pedestrian LOS was recalculated by adding Caltrain, AC Transit, and redevelopment-generated pedestrian trips to the 2001 activity level

| Figure 5.19-2 | Corner & Crosswalk Pedestrian Level of Service (LOS) 2020 Baseline & Project |
|---|---|

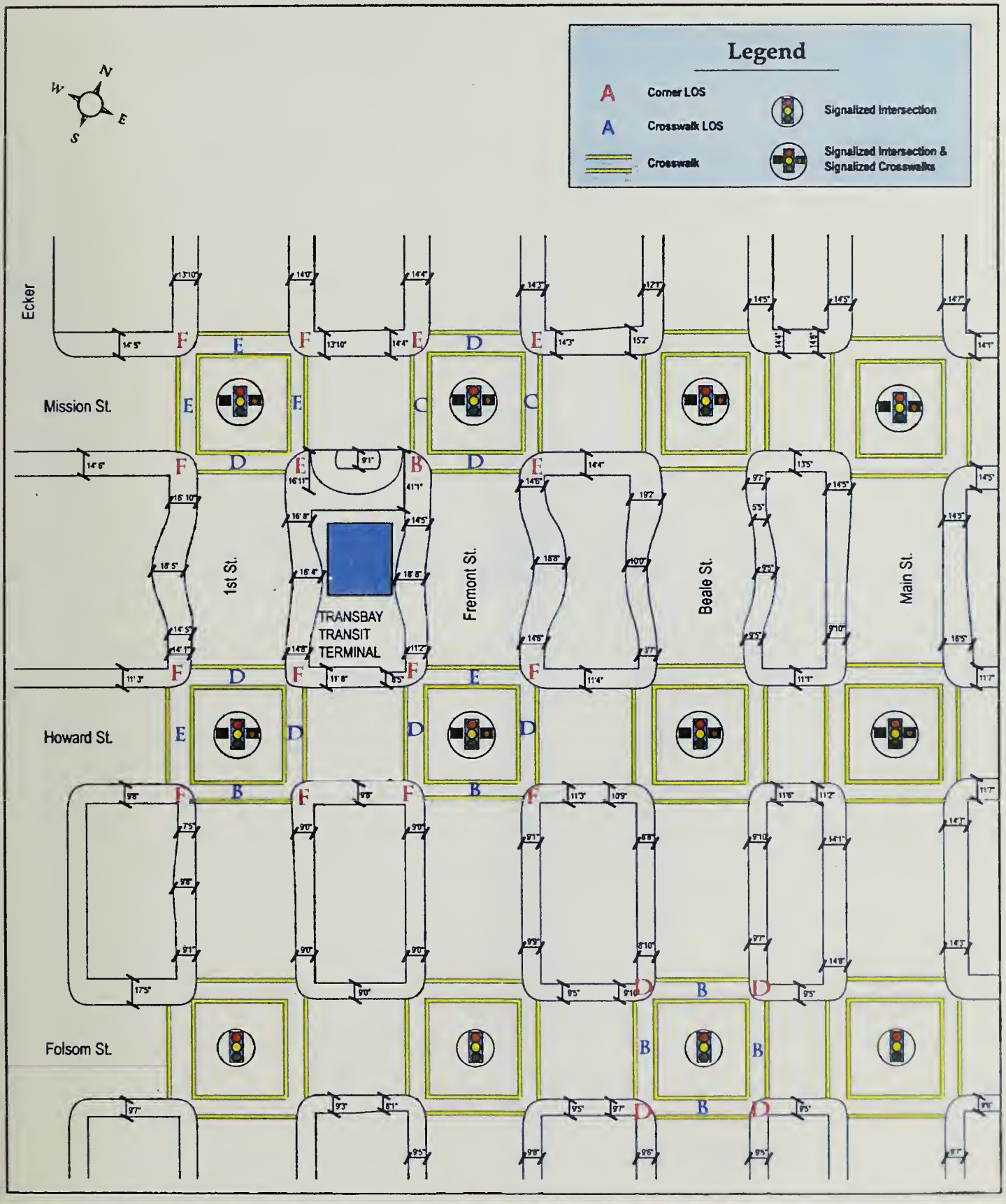


**Table 5.19-6: Pedestrian LOS: P.M. Peak Conditions (Peak 15-minutes) 2020 Baseline Plus Project**

| Intersection | Cross-walk | Ped Space (sq ft/ped) | LOS | Surge LOS | Corner | Ped Space (sq ft/ped) | LOS |
|---|---|---|---|---|---|---|---|
| Mission & First | North | 6 | E | F | NW | -1.5 | F |
| | East | 12 | E | E | NE | -1.2 | F |
| | South | 18 | D | E | SW | 4.4 | F |
| | West | 14 | E | E | SE | 7.9 | E |
| Mission & Fremont | North | 22 | D | D | NW | 6.6 | E |
| | East | 34 | C | D | NE | 8.7 | E |
| | South | 15 | D | E | SW | 42 | B |
| | West | 25 | C | D | SE | 8.9 | E |
| Howard & First | North | 16 | D | E | NW | .47 | F |
| | East | 13 | E | E | NE | 4.3 | F |
| | South | 37 | C | C | SW | -0.16 | F |
| | West | 13 | E | E | SE | 3.3 | F |
| Howard & Fremont | North | 6 | E | F | NW | -2.1 | F |
| | East | 16 | D | E | NE | -2.7 | F |
| | South | 43 | B | C | SW | 2.6 | F |
| | West | 18 | D | E | SE | 4.4 | F |
| Folsom & Beale | North | 73 | B | B | NW | 18 | D |
| | East | 114 | B | B | NE | 18 | D |
| | South | 49 | B | B | SW | 15 | D |
| | West | 53 | B | B | SE | 19 | D |

[1] Level of service (LOS) standards from Highway Capacity Manual (Chapter 13)

**Design Option 1: No Pedestrian Tunnel between Transbay Terminal and Market Street.** Under this design option, all pedestrians would use surface streets to move among analysis zones, including through the five study area intersections evaluated. The pedestrian volumes that would be generated by just the project, in 2020, are shown Table 5.19-7. The volumes are for the 15-minute p.m. peak window of highest pedestrian activity.

**Table 5.19-7: 2020 Project Only Impacts: Increase in Pedestrian in Study Intersections (During 15-minute P.M. Peak -- No Pedestrian Tunnel)**

| Intersection | May 2001 Peds | % Increase Due to Project | Increase Due to Redevelopment | Increase Due to AC & Caltrain | 2020 Project Peds/Intersection |
|---|---|---|---|---|---|
| Mission & First | 895 | 118% | 1,059 | 454 | 2,408 |
| Mission & Fremont | 854 | 74% | 633 | 141 | 1,628 |
| Howard & First | 228 | 293% | 666 | 294 | 1,188 |
| Howard & Fremont | 235 | 282% | 662 | 70 | 967 |
| Folsom & Beale | 117 | 143% | 168 | 12 | 297 |

The total number of pedestrians at each intersection in 2020 was assigned to the crosswalks and corners in proportion to existing travel patterns. Intersection LOS was calculated, as shown in Table 5.19-8 and illustrated in Figure 5.19-3.

**Table 5.19-8: Pedestrian LOS: P.M. Peak Conditions (Peak 15-minutes)**
**2020 Project Only -- No Pedestrian Tunnel**

| Intersection | Cross-walk | Ped Space (sq ft/ped) | LOS | Surge LOS | Corner | Ped Space (sq ft/ped) | LOS |
|---|---|---|---|---|---|---|---|
| Mission & First | North | 24 | C | D | NW | 12 | E |
| | East | 47 | B | C | NE | 9 | E |
| | South | 72 | B | B | SW | 34 | C |
| | West | 55 | B | C | SE | 36 | C |
| Mission & Fremont | North | 57 | B | B | NW | 24 | C |
| | East | 90 | B | B | NE | 30 | C |
| | South[1] | 39 | **C** | **C** | SW | 112 | B |
| | West | 66 | B | B | SE | 31 | C |
| Howard & First | North | 75 | B | B | NW | 19 | D |
| | East | 61 | B | C | NE | 34 | C |
| | South | 171 | A | B | SW | 16 | D |
| | West | 45 | B | C | SE | 27 | C |
| Howard & Fremont | North | 28 | C | D | NW | 14 | E |
| | East | 75 | B | B | NE | 17 | D |
| | South | 196 | A | A | SW | 50 | B |
| | West | 85 | B | B | SE | 31 | C |
| Folsom & Beale | North | 271 | A | A | NW | 81 | B |
| | East | 426 | A | A | NE | 81 | B |
| | South | 194 | A | A | SW | 62 | B |
| | West | 200 | A | A | SE | 86 | B |

[1] Under the Pedestrian Tunnel Design Option, LOS at this crosswalk would improve to LOS B. Otherwise, intersection pedestrian LOS is not anticipated to change with a pedestrian tunnel in place.

**Design Option 2: Underground Pedestrian Tunnel to Market Street**. The terminal and extension design alternatives allow for an optional pedestrian connection between the terminal and Muni Metro and BART, which are located one block away on Market Street. If an underground pedestrian connection to BART were included in the project, some of the *peak period* pedestrian trips in Figure 5.19-3 would be diverted *from the intersections shown in that figure. This following analysis looks at the impact of the underground tunnel on pedestrian LOS in the peak 15-minute period at the intersection of Fremont and Mission Streets.*

*Assuming that many transit users of the Transbay Terminal would find the pedestrian connection underneath Fremont Street convenient just to cross Market Street away from traffic and weather, Table 5.19-9 illustrates with high and low estimates what the numbers of users might be. Those connecting to BART and Muni would make up about one-third of the total low case, or about 2,400 daily users.*

| Figure 5.19-3 | Corner & Crosswalk Pedestrian Level of Service (LOS) 2020 Project |
|---|---|

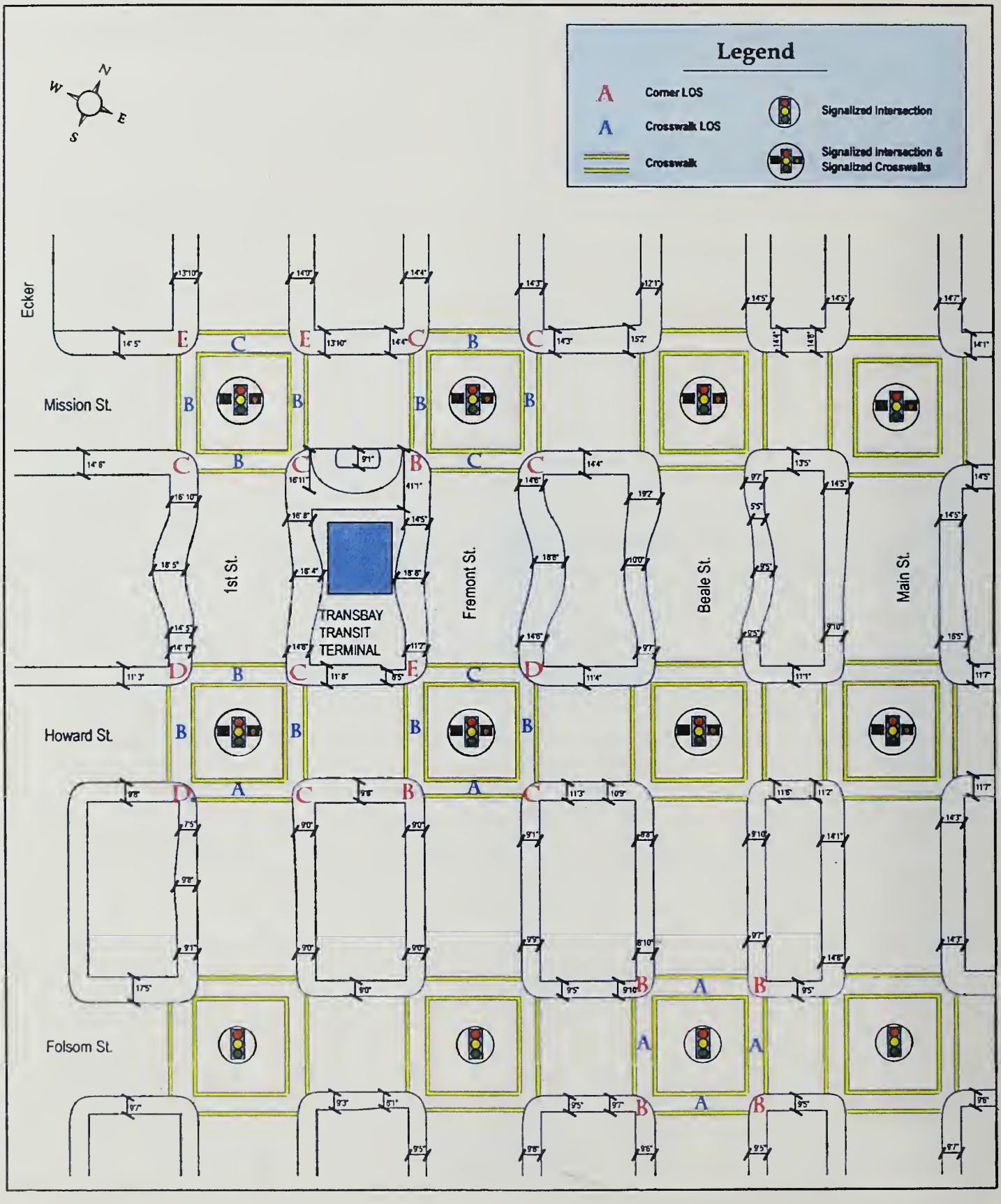


*Table 5.19-9: Potential Daily Users of the Proposed Fremont Street Pedestrian Tunnel*

| Case | High-Speed Rail | Caltrain | AC Transit | Total |
|---|---|---|---|---|
| Low Estimate | 2,300 | 3,400 | 2,400 | 8,100 |
| High Estimate | 4,700 | 6,800 | 5,400 | 16,900 |

*Note: Assumes range of 10% (low) to 25% (high) of transit passengers using the tunnel to cross Market Street in addition to those connecting with BART or Muni Metro.*
*Source: Parsons Corporation, September 2003.*

- **Pedestrian Travel Due to Redevelopment.**

Pedestrians traveling between analysis zones immediately surrounding the terminal were not anticipated to travel underground for one block of their journey. A small amount of pedestrian traffic generated by redevelopment in the Transbay Terminal area might, however, use the underground connection to grain access to BART *or* Muni Metro. The propensity for these people to use the underground connection is limited since either their origin or destination would be above ground. *As a result, in the peak 15-minute period, only one pedestrian trip is expected to be diverted from the Fremont & Mission intersection.*[42]

- **Pedestrian Travel Due to Increased AC Transit Ridership.**

*AC Transit riders* traveling between the Transbay Terminal and analysis zones to the north of Market Street *could use* the underground connection, *but the* propensity for these people to use the connection is limited since AC Transit buses arrive above ground and destinations are also above ground. *For AC Transit riders transferring to BART and Muni Metro, however,* it is assumed that 50 percent would use the underground connection.[43] *The combined impact of transfers and those using the underground passageway to walk between AC Transit and areas north of Market Street is estimated to divert 52 pedestrian trips from the Fremont & Mission intersection during the 15-minute peak period.*[44] The May 2001 Terminal Patron Survey showed that, of the 1,078 AC Transit patrons surveyed, 11 patrons (one percent) transferred between AC Transit and BART, and 42 (about four percent) transferred between AC Transit and Muni Metro.

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[42] SFTA model projections for 2020 Baseline + Project conditions = 472 peak period pedestrian trips between the Transbay Terminal and north of Market Street. Assuming 25% travel through Fremont & Mission, and 10% use underground connection = 1 trip.

[43] Because AC Transit riders would enter the terminal above ground, it is assumed that one-half would make the connection on surface streets and one-half would use the tunnel.

[44] AC Transit projections show 5,469 peak hour AC Transit riders in 2020. Assuming 83% access the terminal as pedestrians = 1,531 ped trips in the peak 15-minute period. The SFTA model predicts 44.5% of pedestrians traveling from/to the terminal will be from/going to north of Market Street = 566 pedestrians. Assuming 25% walk through Fremont & Mission and 10% use the underground connection = 14 pedestrian trips. 1% of the peak 15-minute AC Transit trips are estimated to transfer to BART. Assuming 50% use underground walkway = 7 ped trips. 4% of the peak 15-minute AC Transit trips are estimated to transfer to BART. Assuming 50% use underground walkway = 31 ped trips.

- **Pedestrian Travel Due to Caltrain Ridership**

Those traveling between the train level at the Transbay Terminal and analysis zones to the north of Market Street might use the underground connection, given that the passageway would be on the same level as the Caltrain mezzanine. *In addition, it* is expected that two percent of Caltrain riders would transfer between Caltrain and BART in downtown San Francisco and that all transferring riders would use the underground connection. It is also expected that three percent of Caltrain riders would transfer between Caltrain and Muni Metro in downtown San Francisco and that all transferring riders would use the underground passageway. *The combined impact of transfers and those walking between Caltrain and areas north is estimated to divert 55 pedestrian trips from the Fremont & Mission intersection during the 15-minute peak period.*[45]

A total of 108 pedestrian trips are expected to be diverted from the Fremont and Mission Streets intersection *during the 15-minute peak period.* The pedestrian LOS impacts *would* not change at this intersection under any future scenario except for 2020 Project Only Impacts. The south crosswalk would improve from LOS C to LOS B.

- **Other Pedestrian Conditions**

Under the West Ramp Alternative, a street-level bus boarding area would be located between Fremont and Beale Streets. Muni bus lines 2/3, 5, 6/7, 38 and 38L and Golden *Gate* Transit basic bus service lines 20, 30, 50, 80 and 90 would use the street-level boarding area. The Muni buses listed currently board and alight on the "hump" area in front of the terminal, while the Golden Gate Transit lines currently board along Mission and Fremont Streets. As a result of the project, more pedestrians would have to cross Fremont Street to reach the street-level bus boarding area. About 100 buses would pull out of this area between approximately 5:00 p.m. and 7:00 p.m.

To facilitate transit access between the bus boarding area and Fremont Street, the Terminal/Extension Project designs include a new traffic signal on Fremont Street between Mission and Howard Streets. This signal would be located just south of the terminal and may also include a full stop phase to facilitate pedestrian flows crossing Fremont Street.

**Pedestrian Mitigation Measures**. Under the 2020 Baseline plus Terminal/Extension Project condition, eleven corners and two crosswalks fall to pedestrian Level of Service F. Isolating the *P*roject *O*nly impacts from the 2020 Baseline plus Project condition indicates that the project itself does not cause the level F conditions. The lowest pedestrian levels of service associated with the project occur at First and Mission Streets where two corners fall to LOS E, and at Howard and Fremont Streets where one corner falls to LOS E.

[45] 548 15-minute peak Caltrain-generated pedestrian trips. If 44.5% travel from the terminal to north of Market Street and 25% of those walk through the Fremont & Mission intersection, and if 25% of those use underground tunnel, this equals 15 ped trips. There are 785 predicted peak 15-minute total Caltrain trips. Of these, 2% (16 trips) are expected to transfer to/from BART and 3% (24 trips) are expected to transfer to/from Muni, all of which would use the underground connection.

Pedestrian mitigation measures that can be considered include:

- Preventing narrowing of sidewalks through future construction;
- Using future construction or redevelopment as opportunities to increase building set-backs thereby increasing sidewalk widths. Particular areas where such widening is most needed include:
    - The southeast corner of Fremont and Missions Streets,
    - The northeast corner of First and Missions Streets,
    - The north side of Mission Street between First and Fremont, and
    - Sidewalks south of Howard Street along Folsom, First, Fremont, and Beale that are less than 10 feet wide;
- Ensuring that Transbay Terminal design increases corner and sidewalk widths at the four intersections immediately surrounding the Transbay Terminal;
- Eliminating or reducing sidewalk street furniture on corners, such as newspaper boxes and magazine racks. For example, sidewalk furniture on the four corners of Mission and First currently reduces effective corner space, blocks pedestrian movements, and/or exacerbates space issues associated with bus queuing;
- Re-timing traffic light signalization. This could improve pedestrian levels of service at each of the intersections studies that fall into LOS F;
- Providing cross-walk count-down signals. This would be most valuable at the intersections and cross-walks immediately surrounding the terminal, especially since pedestrians are more likely to dash on a flashing hand when trying to catch a bus or train;
- Providing lights within crosswalks *to warn* when pedestrians are present in the crosswalk, such as at the cross-walk associated with the mid-block bus loading area, and
- Providing crosswalk signalization at intersections where they do not exist already, such as Folsom and Beale Streets.

### 5.19.6.2 Bicycle Impacts

Bicycle traffic growth with and without the project was estimated by comparing existing bicycle volumes, obtained from field surveys, with estimated volumes for the 2020 Baseline plus the Transbay Terminal/Caltrain Downtown Extension Project condition and the 2020 Project condition.

While there is no standard for determining bicycle *l*evels of *s*ervice, the increase in bicycle traffic was estimated between existing conditions, the 2020 Baseline plus Project, and the 2020 Project Only conditions. The estimate was based on the San Francisco County Transportation Authority's transportation model outputs showing bicycle traffic between the analysis zones, assuming full Transbay Terminal Project build-out and redevelopment. The bicycles added to the street due to increased AC Transit ridership and Caltrain ridership were also estimated.

The estimates show that peak bicycle traffic at the five study intersections could increase substantially over the next twenty years. It was estimated that up to 425 bicycle trips could travel through the five study intersections in the 15-minute peak window under the 2020 Baseline plus Project condition and 290 under the 2020 Project condition compared to a total of 45 counted in the Spring of 2001. It should be noted, however, that there is no standard for determining bicycle level of service.

*Some Caltrain riders are projected to ride bicycles between Caltrain and their ultimate destinations. It is estimated that the new terminal will attract about 6,800 primary-direction, peak period commuters (traveling inbound to the Transbay Terminal in the a.m.) and about 3,125 reverse-direction, peak-period commuters (traveling outbound from the Transbay Terminal in the a.m.).*

*Existing data on bike usage of Caltrain passengers at the Fourth and Townsend Station indicates that approximately 5 percent of primary-direction, peak period commuters and 15 percent of reverse-direction, peak period commuters use a bicycle as part of their total commute trip.*

*Assuming these same proportions of bike trips to and from the new Transbay Terminal, it is estimated that there will be 340 primary-direction bike/Caltrain commuters and 469 reverse-direction bike/Caltrain commuters. However, not all of these commuters will require bike parking at the Transbay Terminal. Assuming that 20% of the primary-direction commuters and 35% of the reverse direction commuters require bike parking, a total of 232 bicycle storage spaces would be needed.*

*The San Francisco Department of Parking and Traffic is considering an extension of the Howard Street bike lane (that currently runs between Fifth and Eleventh streets) to Fremont Street and the provision of a new bike lane on Second Street. The addition of these lanes would improve the quality and comfort of bicycling in the area around the Transbay Terminal.*

## 5.20 CONSTRUCTION STAGING AND METHODS

Project construction activities that would occur with the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project would not occur for the No-Project Alternative. Even though project construction activity would be relatively short-term and geographically limited, potential construction impacts were an important factor in the selection of the proposed alternatives considered in this DEIS/DEIR.

For example, the Tunneling Option for the Caltrain Extension was evaluated in part due to its reduced impacts on adjoining land uses during construction. Tunneling in lieu of cut-and-cover could be used for that portion of the alignment with underlying rock geologic formations. These formations occur along the alignment from approximate*ly* Station 51+00 (Townsend and Third Streets) to Station 81+00 (Second and Folsom Streets).

Since construction impacts of the project are of concern to the community, this section describes the proposed construction process and methods. Section 5.21 describes potential impacts and mitigation measures for construction.

This section divides the construction process into several steps based upon the type of construction and when it would occur. Section 5.20.1 summarizes preconstruction activities. Section 5.20.2 summarizes construction activities.

### 5.20.1 Pre-construction Activities

A summary of preconstruction activities is provided in Table 5.20-1 and discussed individually in the following.

**Table 5.20-1: Pre-construction Activities -- Caltrain Extension**

- Undertake Detailed Geotechnical Investigation
- Prepare Final Design and Construction Contracts
- Prepare Vehicular and Pedestrian Traffic Control/Detour Plans
- Undertake Building Data Survey
- Undertake Pre-Construction Business Survey
- Establish Construction-Related Community Information / Outreach Program
- Acquire Property and Easements:
    - Easements involve specific parcels along: Seventh, Townsend, Stanford, Second, Colin P. Kelly, Brannan, DeBoom, Federal Way, Bryant, Tehama, Howard, and Natoma
    - Full acquisitions include properties along Brannan, Howard, Natoma, Minna, Tehama, Beale, and the existing Transbay Terminal Site

***Preliminary Engineering*, Development of Construction Contracts, and Final Design.** During *preliminary engineering and* final design, detailed design elements of the Transbay Terminal and Caltrain Downtown Extension would be developed, reflecting, among other subjects, final geotechnical investigations. *Construction contract packaging will be determined as part of the Preliminary Engineering activities.* As part of the final design, *t*he TJPA and the JPB would work with property owners planning to build new structures adjacent to the proposed Project components to integrate construction of the Caltrain project with construction of the private structures to reduce Project construction impacts.

**Vehicular and Pedestrian Traffic Plans.** Construction of the Project would temporarily interfere with the normal flow of traffic, causing some lanes and streets to be closed to vehicles

for various durations. Some streets would be subject to lane and temporary closures as summarized in Table 5.20-2. During final design, street traffic control plans would be developed in cooperation with Caltrans, the City/County of San Francisco (DPT, police and fire departments, and Muni) to accommodate required pedestrian and traffic movements. To the extent practical, traffic lanes would be maintained in the appropriate directions, particularly during peak traffic hours.

**Table 5.20-2: Street Closures During Construction**

| |
|---|
| **Townsend Street (Fifth to Clarence Place).** Cut-and-cover construction would be progressed on a block by block basis, so approximately one block would be affected at a time. There would be no on-street parking during construction of a particular block. A limited *number* of complete closures to all traffic would occur during cut-and-cover construction until a temporary street deck is placed over the subway construction. A limited *number* of complete closures *are* also required for removal of the deck and reconstruction of the roadway. Cross street traffic would also be subject to limited closures. Eight business driveways would be *affected* by the closures.<br><br>If tunneling construction is chosen for a portion of the alignment it would begin on Townsend Street just east of Third Street. The temporary decking installed for the cut-and-cover construction in the area of the beginning of the tunnel would remain in place until tunneling was completed. A limited number of complete closures would then be required for removal of the decking and pavement reconstruction. |
| **Clarence Place (Between Townsend and Brannan)** For both cut-and-cover and tunneling construction alternatives the south end of this block would be completely closed for limited times while construction on Townsend Street, east of Third Street, occurs. |
| **Stanford Street (Between Townsend and Brannan)** For the cut-and-cover construction alternative, the south end of this block would be completely closed during construction of the line segment for this block. During construction, access from Brannan would remain available.<br>This street would not be *affected* by the tunneling alternative. |
| **Second Street (Brannan to Howard).** For the Cut-and-Cover Option, construction would be progressed on an approximate block-by-block basis, so approximately one block would be affected at a time. There would be no on-street parking during construction. A limited *number* of complete closures to all traffic would occur during cut-and-cover construction until a temporary street deck is placed over the subway construction. A limited *number* of complete closure*s would* also *be* required for removal of deck and reconstruction of the roadway. Cross street traffic would also be subject to limited closures. Eight (8) business driveways and three (3) residential driveways *would be affected.* Temporary alternative access would be required to maintain access to dead end streets at De Boom, Federal, Dow Place, and Tehama. Temporary access would be provided through easements across through private property such as parking lots.<br><br>For the Tunneling Option, there would be very limited impacts to streets. It is anticipated that tunneling would progress from two locations in this segment, midway between Brannan and Bryant, and just south of Folsom. At these locations vertical shafts will be constructed and temporary decking installed. A limited *number* of complete closures would be required during construction of the vertical shafts and placement of temporary decking. A limited amount of on-street parking will be lost during tunneling operations. Traffic would be maintained throughout tunnel construction. A limited *number* of complete closures would be required for removal of the temporary decks and pavement reconstruction. |
| **Natoma Street (Between First and Second)** During construction of the Transbay Terminal this street would be subject to temporary closure for this portion of its alignment. |

| Table 5.20-2: Street Closures During Construction |
|---|
| |
| **First Street (Between Howard and Mission)** During construction of the Transbay Terminal this street would be subject to limited closures while temporary bridging was installed to allow for subterranean construction under the road. |
| **Minna Street (Between First and Second)** During construction of the Transbay Terminal this street would be subject to temporary closure for this portion of its alignment. |
| **Fremont Street (Between Howard and Mission)** During construction of the Transbay Terminal this street would be subject to limited closures while temporary bridging was installed to allow for subterranean construction under the road. |
| **Beale Street (Between Howard and Mission)** During construction of the Transbay Terminal the street would be subject to limited closures while temporary bridging was installed to allow for subterranean construction under the road. |
| **Main Street (From Just South of Bryant to Howard)** Construction would be progressed on an approximate block-by-block basis, so approximately one block would be affected at a time. There would be no on-street parking during construction of each block. A limited *number* of complete closures to all traffic would occur during cut-and-cover construction until a temporary street deck is placed over the subway construction. A limited *number* of complete closures would also be required for removal of the temporary deck and reconstruction of the roadway. Cross street traffic would also be subject to limited closures. Eight (8) business driveways would be *affected* by the closures. |
| **Mission Street (Beale to The Embarcadero)** Construction would be progressed block by block, so approximately only one block would be affected at a time. There would be no on-street parking during construction of each block. A limited *number* of complete closures to all traffic would occur during cut-and-cover construction until a temporary street deck is placed over the subway construction. A limited *number* of complete closures *would* also *be* required for removal of *the* deck and reconstruction of the roadway. Cross street traffic would also be subject to limited closures. Four (4) business driveways would be *affected* by the closures. |
| **First, Fremont and Beale Streets (Between Howard and Folsom)** Temporary night time closures would be required for construction of the temporary and permanent access ramps to the permanent and temporary bus terminals. Some limited amount of on-street parking would be lost during construction activities. |
| **Howard, Tehama, Clementina, Folsom and Harrison Streets (Between First and Second)** Temporary night time closures would be required for construction of the permanent access ramps to the Transbay Terminal. Some limited amount of on-street parking would be lost during construction activities. |
| **Essex (Between Folsom and Harrison)** Some on-street parking would be temporarily eliminated during construction of the permanent access ramps to the Transbay Terminal. |

**Building Data Survey**. A pre-construction structural survey would be completed to determine the integrity of existing buildings adjacent to and over the proposed extension. This survey would be used to finalize detailed construction techniques along the alignment and as the baseline for monitoring construction impacts during and following construction. During construction, the TJPA and JPB would monitor adjacent buildings for movement and, if movement is detected, take immediate action to control the movement.

**Detailed Geotechnical Investigation**. During final design, additional sampling (drilling and core samples) and analyses of subsurface soil/rock conditions would be used to detail and finalize the excavation and its support system to be used in the retained cut, cut-and-cover and tunnel portions of the extension. Current data, including subsurface sampling conducted in 1995 and 1996 for the 1997 Caltrain DEIS/DEIR have been used to identify the proposed construction techniques presented in the following sections, which form the basis for the impact analysis that follows in Section 5.21.

**Pre-Construction Business Survey**. Prior to construction, the TJPA and JPB would contact and interview individual businesses along the alignment to gather information and develop an understanding of how these businesses carry out their work. This survey would identify business usage, delivery/shipping patterns, and critical times of the day or year for business activities. The survey would assist in: (a) the identification of possible techniques during construction to maintain critical business activities, (b) the analysis of alternative access routes for customers and deliveries to these businesses, (c) the development of traffic control and detour plans, and (d) the final determination of construction practices.

**Establishment of Construction Community Information/Outreach Program**. A community construction coordination program would be established to provide on-going dialogue *among* the TJPA, the JPB and the affected community regarding construction impacts and possible mitigation/solutions. The program would include dedicated personnel, including an outreach office in the construction area, to deal with construction coordination. An important element of this program would be the dissemination of information in a timely manner regarding anticipated construction activities.

**Land and Easement Acquisition.** Properties would need to be acquired prior to construction of the project. In addition, property easements would be obtained for those properties above the proposed tunnel portion. See Section 5.2 for a complete discussion of these acquisitions, including a review of relocation assistance that would be provided.

### 5.20.2 Construction Activities

Types, location, and lengths of construction activities that would occur for the Project are provided in Table 5.20-3 and are discussed below.

**Underground Utility Relocation.** To the extent possible the Caltrain extension has been located to avoid conflicts with the space occupied by major utilities. In certain instances, the positioning of the alignment, station, and ancillary facilities would require that conflicting utilities be relocated. Relocation of utilities to a new permanent location so that they would not be affected by alignment or station construction would generally be performed prior to construction of the extension. Construction equipment typically required for utility relocation and restoration includes: excavator/backhoes, trenchers, trucks, cranes and generator/compressors. Cement trucks, pavers, rollers, and power compactors are typically required for street restoration.

**Table 5.20-3: Construction Activities**

| Construction Activities | Location | Length in Feet |
|---|---|---|
| Relocate Utility Lines | See Section 5.12 – Utilities | Not Applicable |
| Demolish Buildings | As required along Townsend, Stanford, *Second*, Howard, and Streets. Also station platforms and maintenance buildings at current Caltrain San Francisco Station and Yard. | Not Applicable |
| Construct Temporary Bus Terminal and Access Ramps | Needed to facilitate construction of the permanent Transbay Bus Terminal. See Chapter 2 of this EIS/EIR *for* location of proposed facilities. | Not Applicable |
| Construct New San Francisco Yard Support Tracks | Within the existing JPB right of way between Common Street and 16th Avenue. | 1,550 |
| Construct New Fourth and Townsend Station Tracks, Platforms *and Ancillary Facilities* | Within the existing JPB right of way and San Francisco Yard, from Seventh to Fourth Street. | 3,000 |
| Construct Retained-Cut Section | In existing San Francisco Yard between Common and Fifth Streets along Seventh and Townsend Streets. | 1,850 |
| Construct Cut-and-Cover Section *and Ancillary Facilities* | **Cut-and-Cover Option – Both Alternatives:** Along Townsend Street from between Fifth and Fourth Streets up to Second Street. Along Second Street to Howard Street. From Howard Street into the Transbay Terminal. | 3,550 |
| | **Second-to-Main Alternative:** From Transbay Terminal along Main Street to just south of Harrison Street. | 2,050 |
| | **Second-to-Mission Alternative:** From Transbay Terminal along Mission St., ending just before The Embarcadero. | 1,450 |
| Tunnel Option | Construction of tunnel *and ancillary facilities* from Townsend Street starting just east of Third Street, crossing under Stanford Street and entering Second Street at Brannan Street, continuing up Second Street to Folsom Street. | 3,000 |
| Construct New Transbay Terminal, *Ancillary Facilities*, and Permanent Access Ramps | See Chapter 2 of this EIS/EIR for description of the alternatives for the permanent Transbay Terminal and Access Ramps. | 1,300 |
| Construct Permanent Offsite Bus Storage and Access Ramps | Needed for permanent current Transbay Bus Terminal operations. See Chapter 2 of this EIS/EIR for a description of these permanent facilities. | Not Applicable. |
| Reconstruct Streets | **San Francisco Yard to Transbay Terminal Corridor (Cut and Cover Option):** Along Townsend St. from between Fifth and Fourth Streets up between Third and Second Streets. Along Second Street from Brannan St. to Howard St. A portion of Howard Street between Second and First Streets | 5,250 |
| | **Main St. Alignment Cut and Cover Option:** From Transbay Terminal along Main Street from Howard to just south of Harrison St. | 1,450 |

**Table 5.20-3: Construction Activities**

| Construction Activities | Location | Length in Feet |
|---|---|---|
| | **Mission Alignment Cut and Cover Option:** From Transbay Terminal along Mission St., ending just before The Embarcadero. | 1,300 |
| | **San Francisco Yard to Transbay Terminal Corridor Cut-and-Cover and Tunneling Options:** Tunneling a portion of the alignment would reduce the amount of street reconstruction. Tunneling would start on Townsend Street just east of Third Street, then would go under the buildings located in the block at the corner of Townsend and Second Streets. The tunnel would then extend down Second Street to Folsom Street. | 3,180 |

Utilities, such as high-pressure water mains and gas lines, that are not to be permanently relocated away from the work site, would be temporarily removed from the construction area. For these relocations, no or very brief disruption (less than a day) could occur to utility service. The utilities would be relocated temporarily at the early stages of construction and reset in essentially their original locations during the final backfilling above the construction.

Utilities within the subsurface construction area that do not need to be relocated, either permanently or temporarily, would be uncovered during the early stages of excavation. These buried utilities, with the possible exception of sewers, are generally found within several feet of the street surface. They would be reinforced, if necessary, and supported during construction by hanging from support beams spanning across the excavation.

If tunneling is used for a portion of the alignment, utility issues would be eliminated in those areas.

**Building Demolition.** The Caltrain Downtown Extension alignment has been selected to minimize, to the extent possible, impacts on adjoining buildings and on the communities through which it passes. Still, for cut-and-cover construction methods, some properties would have to be acquired and the structures on these properties demolished. No building demolitions would be required in areas where the Tunneling Option is constructed.

Equipment typically involved in demolition includes: crawler cranes, crawler dozer/loaders, pavement breakers, rubber-tired loader/bob cats, trucks, excavator/backhoes, generator/ compressors, and water trucks for dust control.

**Building Underpinning.** Where the Tunneling Option is applied, existing buildings above the tunnel alignment would be underpinned. This underpinning would support the building in case of a partial tunnel collapse during construction. Equipment typically involved in underpinning includes: specialized pile drivers, air compressors, pneumatic tools such as jack hammers, front end loaders and dump trucks.

**Surface Rail Line and Station Construction.** Both Caltrain Extension Alternatives would require removal and reconstruction of the existing yard tracks at the Fourth and Townsend Station including the removal and reconstruction of station platforms and the removal of existing maintenance buildings. Track removal and reconstruction would begin just north of Sixteenth Street and end at the existing station at Fourth Street. This work would provide the required track connections and yard space for the new mainlines crossing through the existing yard as they descend into the alignment proceeding down Townsend Street. This work would occur immediately after mobilization.

Equipment used for removal of existing rail and platform and building improvements and construction of new track and station improvements include: crawler dozer/loaders, surface graders, rubber-tired loaders/bob cats, compactors, generators/compressors, rollers, small cranes, excavators/backhoes, trucks, concrete trucks, railroad track-laying equipment, welding machines, and water trucks for dust control

**Retained Cut Section.** Prior to entering the subterranean subway section near *Fifth* Street, the new extension main track alignments would transition from surface to subsurface in a retained cut (depressed section) portion of the alignment (Station 12+50 to 31+00). This would occur in the existing San Francisco Yard between 7$^{th}$ Street (near Berry Street) and Townsend Street (near *Fifth* Street). Immediately adjacent to these main track alignments, in the area bounded by the corner of *Seventh* and Townsend Streets, is a fully depressed area that will accommodate yard tracks. This depressed yard area will also be part of a retained cut section.

**General Approach to Temporary and Permanent Structures.** A temporary structural support system is required to retain the cut during excavation of material. After excavation this temporary system will be incorporated into the permanent retained cut structure.

**Temporary Structures and Excavation**. This area of the project involves soft soils, including extensive deposits of soft Bay Mud and liquefiable fills. Due to the significant lateral loads expected from these soils on the retained cut side walls, horizontal support would be required. Temporary struts and rakers would be installed at various levels as excavation proceeds.

Rigid and impermeable cut off would be used for the temporary side walls. The most economical method for building the cut-off walls is the Deep Mixing Method (DMM). This produces a wall commonly referred to as a soil cement wall. This method involves mixing of cement slurry with in-situ soil to construct a continuous and practically impermeable wall made up of individual columns. Each column is structurally reinforced with vertical steel beams that are inserted into the soil-cement mix while the mix is still fluid (i.e., before it sets and hardens). Such walls have the advantage that they are competitive economically, they minimize the risk for adverse impacts associated with ground deformations during excavation, and eliminate the need for costly dewatering.

A specialized auger (Figure 5.20-1) is used in this process. This construction technique involves some displacement of soil (25-30 percent), which bubbles out of the auger hole onto the ground. This soil, which is mixed with the cement, would be left to harden and then be removed by truck.

The soil cement walls are typically constructed to extend deep and tie into an impermeable layer below the base of the planned excavation so that under seepage into the excavation can be minimized. The soil-cement walls would be used not only for temporary excavation support but also for permanent groundwater cutoff, a critical concern in this area where high ground water levels are anticipated. Figure 5.20-2 shows the drilling of auger holes and the creation of a soil cement wall.

Equipment used for installation of soil-cement walls typically includes: a soil-mix wall rig for in situ soil mixing (see Figures 5.20-1 and 5.20-2), a soil-mix wall batch plant for grout preparation, a crane for installation of soldier piles, back hoe, rubber tired loaders and trucks.

After the cut-off walls have been constructed, excavation would proceed from top down. The walls of the depressed yard area excavation would be supported with rakers and struts. Rakers would consist of heavy steel pipes. The first level of rakers is usually installed at a shallow depth. The excavation would then progress sequentially, and would not extend more than two to three feet below the level of the next required raker support, until the rakers are in place and secure. For the depths of excavation contemplated, three to four levels of supports are anticipated in the vertical plane. The walls of the adjacent depressed mainline track corridor would be strutted near the existing ground line for the deeper cut sections with heavy steel pipes. Groundwater within the excavation would be collected in sumps and pumped to a settling basin before it is disposed in accordance with applicable regulations.

**Permanent Structure Installation.** After excavation is complete piles would be driven through out the bottom of the retained cut areas. These are required for the support of the permanent bottom slab. After piles are driven then the bottom slab would be constructed. The interior face of the soil cement piles would be removed to expose the flange of the steel pile. Steel shear connectors would be welded to the flange and reinforced concrete fascia wall would be cast against the steel piles to form the permanent side walls of the retained cut section. Interior support columns would be constructed next followed by permanent strut systems. A top slab would be constructed last over the depressed yard area. The strut and slab system over the depressed yard area would be used for parking or useable yard area.

Equipment typically used for permanent subway structure construction includes: cranes, concrete trucks, trucks, concrete pumps, welding machines, generator/compressors, rubber-tired loader/bobcat and fork lift.

**Cut-And-Cover Construction.** Cut-and-cover construction would be used from near *Fifth* Street at Station 31+00 to the west end to the Transbay Terminal at approximate*ly* Station 90+50, and from the east end of the terminal at approximate*ly* Station 104+50 to the end of the line at 122+95 (Main Street Alternative). An alternative tunneling construction method is proposed as an alternative for a portion of this alignment from Station 51+00 to 81+00. This alternative method is described below and shown in Figure 5.20-3. In addition the Transbay Terminal will be constructed using similar methods to cut and cover and this is also described below.

**Figure 5.20-1: Soil Cement Wall Augers In Use**

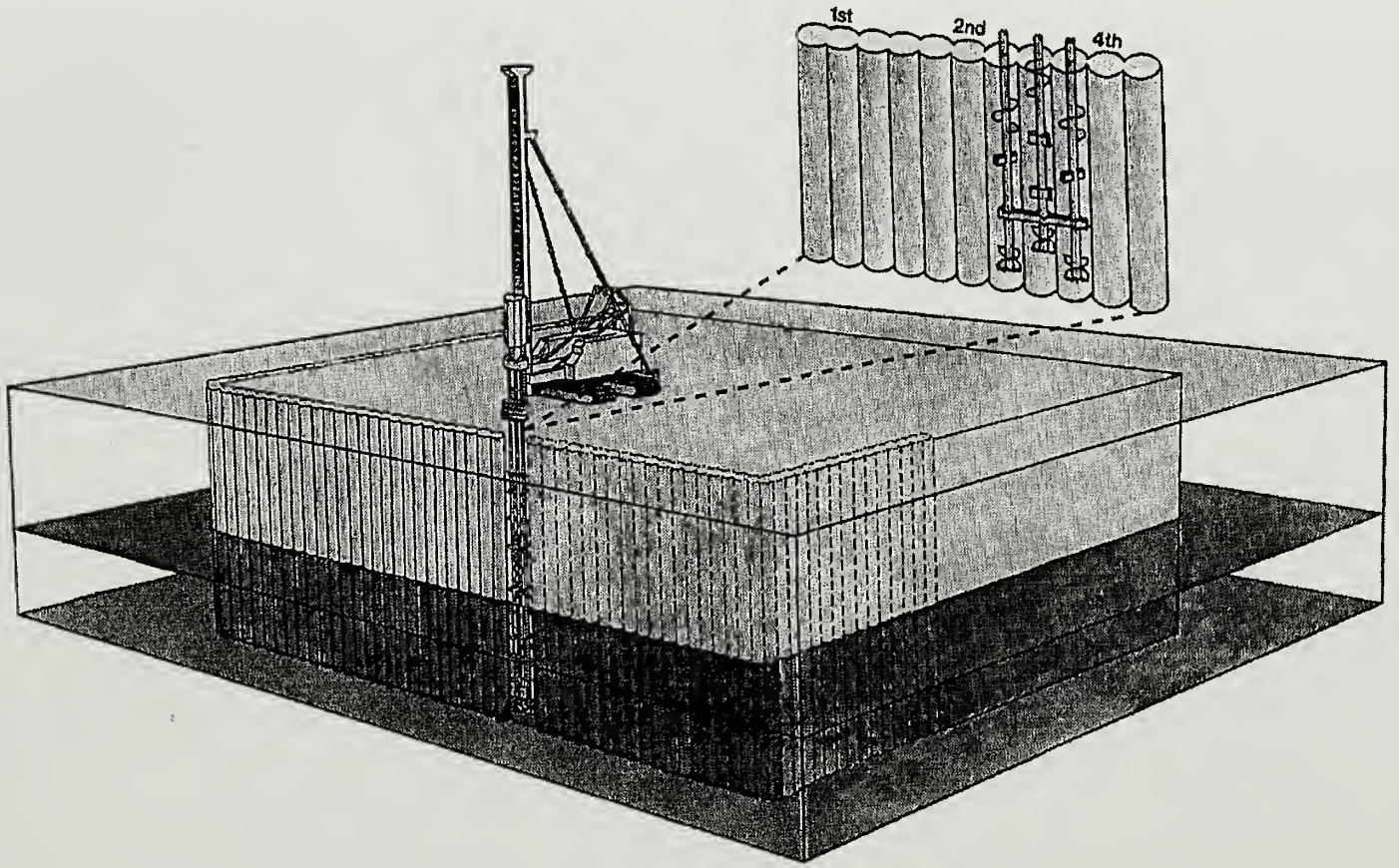



**Figure 5.20-2: Column Construction for Soil Cement Walls**

**Support of Adjacent Structures.** The first step in cut-and-cover construction is to assure support for foundations of buildings adjacent to the excavation. Underpinning of buildings adjacent to the cut-and-cover sections is not anticipated at this point. Instead, control of potential movement of adjacent structures is proposed to be accomplished by use of excavation support systems, which, in conjunction with proper excavation and bracing or tie-back procedures, can serve as protection for the adjacent structures. This is common practice for the Bay Area and was successfully used for the Muni Metro Turnaround project at the east end of Market Street.

The excavation support system currently proposed for this project is described in the following sections. During construction, adjacent buildings would be monitored for movement and, if movement is detected, take immediate action to control the movement.

**General Approach to Temporary and Permanent Structures.** The same approach will be followed as with retained cut construction wherein the temporary structure will be incorporated into the permanent structure. One exception will be in the area of the Transbay Terminal. The Transbay Terminal construction will construct separate temporary and permanent structures as described below.

**Temporary Structures and Excavation.** The methods of excavation support vary with the ground conditions. The cut and cover alignment can be divided into three segments: (1) areas where the ground consists predominantly of soft soils with high groundwater conditions (along Townsend Street east of *Fifth* Street); (2) areas where the subsurface soils consist of stiff clays and/or dense sands (all remaining areas not described in segments 1 & 3); and (3) areas where the excavation will be in rock (along *Second* Street between Brannan and Folsom and along Main Street between Folsom and Harrison). The temporary support and structure systems that would be used within each of these three areas are described below

Excavations in Soft Soils/Stiff Clays/Dense Sands – Excavation support and excavation in these soils will be the similar to that for the retained cut work in that soil cement walls would first be constructed. Prior to excavation deck beams and temporary decking would be installed at the top of the proposed excavation as described below. The deck beams and temporary deck maintain vehicular traffic during construction. After temporary decking is installed, excavation would proceed from top down. The walls of the excavation would be supported with internal struts or ground anchors (tie-backs) as excavation proceeds.

The use of tie-backs is preferred over internal struts because they provide more of an unobstructed work area for excavation. Tie-backs, however, are not suitable for use in soft soils. In soft soils internal struts would be used. Tie-backs would be used in stiff clays and dense sands.

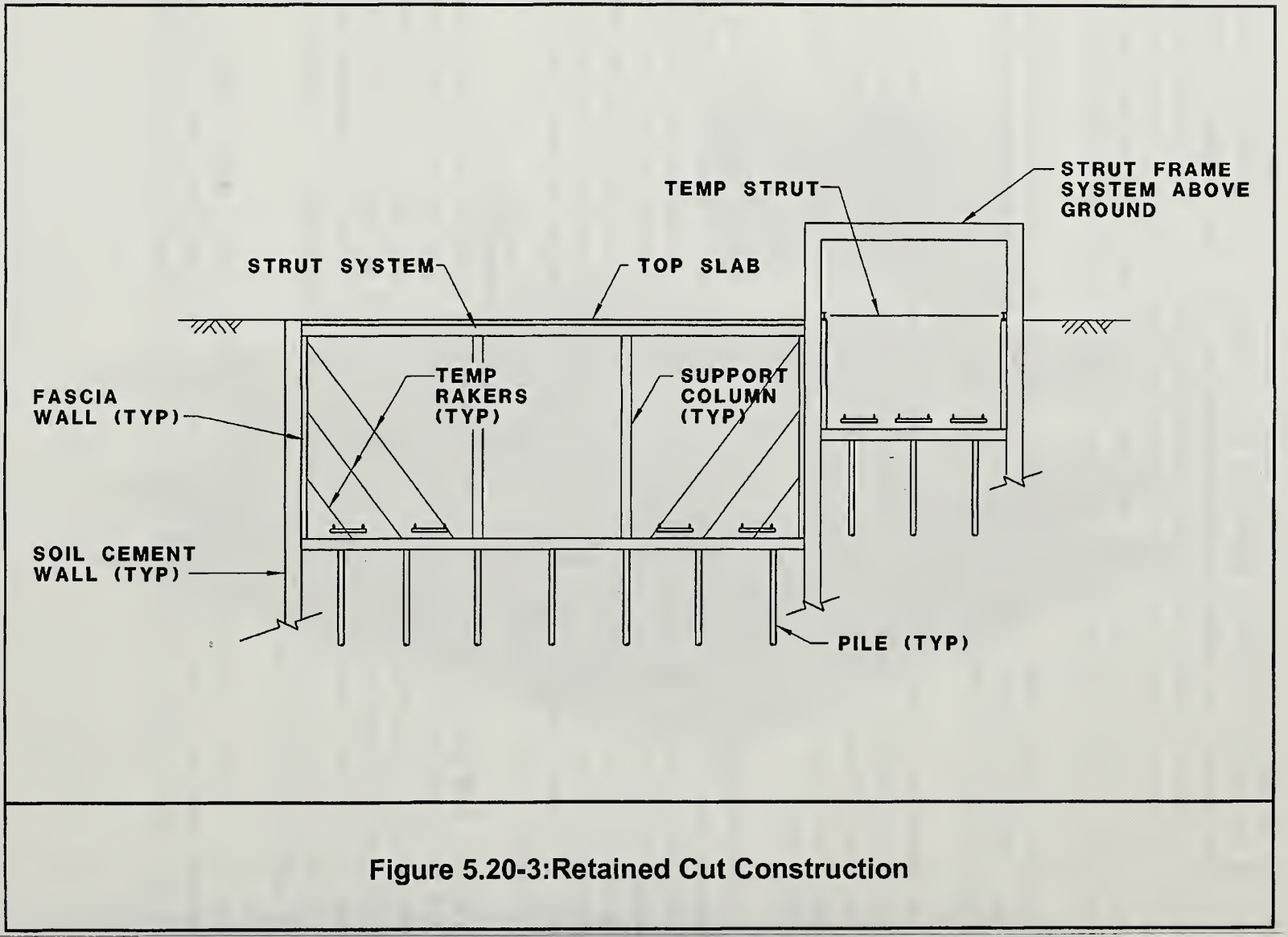



**Figure 5.20-3:Retained Cut Construction**

In those locations tie-backs would be drilled from inside the excavation and could extend between 50 and 75 feet back from the face of excavation. The tie-backs consist of drilling a small diameter (5 to 6 inches) hole, installing the anchorage element, and filling the hole with grout. During the drilling process, the hole would be supported with steel casing to avoid caving of the ground, which can cause undesirable settlements. After the grout had gained sufficient strength, the anchors would be stressed and secured against the excavation walls.

Because tie-backs would extend outside the excavation limits, and in many cases extend under existing structures along the project alignment, installation of tie-backs would require permission from the owners of the adjacent structures to install the temporary tie-backs under their property. This is a normal process and usually the necessary agreements between the project owner and the property can be negotiated.
Internal struts, if used, would consist of heavy steel pipes spaced every 15 to 18 feet horizontally and 10 to 12 feet vertically.

The excavation progresses sequentially, and does not extend more than two to three feet below the level of each horizontal support (tie-back or strut), until the supporting struts are in place and secure. For the depths of excavation contemplated for the downtown extension project, three to four levels of struts are anticipated. Groundwater within the excavation is collected in sumps and pumped to a settling basin before it is disposed in accordance with applicable regulations.

Excavations in Rock - The Deep Mixing Method is not suitable in areas where rock is encountered. The most likely method of excavation support is to use cast in drilled hole (CIDH) piles spaced 8 to 10 feet along the alignment. The piles are constructed by using an auger to drill a hole (approximately 36" in diameter for this project) to a depth of 5 to 10 feet below bottom of permanent subway structure. Steel columns are then set in the holes and encased in concrete. The exposed rock in the spaces between the piles is sprayed with shotcrete to hold the rock in place.

After the CIDH piles have been installed along both sides of the excavations, deck beams and temporary decking is installed as described below. Excavation then progresses in stages from top down. Lateral support for the excavation would be provided using either internal struts or rock anchors. Rock anchors are generally preferred over internal struts because they provide an unobstructed area in the excavation. This makes operation of excavation equipment much easier than if struts were present. Rock anchors would be spaced about 10 foot horizontally and 14 foot vertically.

Excavation of the rock would be carried out, most likely using heavy excavating and ripping equipment. Where hard rock is encountered, blasting may be required. However, given the condition of the rock in the study area, which is highly fractured and weathered, blasting, if required, is anticipated to be minimal.

Dewatering from inside the excavation would be required. The quantities of seepage should be small enough to be manageable with interior sumps and pumps. It is anticipated that predraining using deep wells will not be effective in the Franciscan rock formation to be encountered.

The equipment required for installing excavation support and for excavation is identified in the Retained-Cut section above.

**Temporary Decking Installation**. Temporary roadway decking would be installed in progressive stages over the proposed cut. Prior to beginning of excavation of the cut, lateral trenches would be excavated across the alignment from one sidewall to the other to permit installation of deck beams. These trenches are generally excavated during the nighttime and covered to permit normal traffic flow during the day. When a sufficient number of deck beams have been installed, a shallow excavation of approximately eight feet in between the deck beams is made. This excavation is designed to uncover buried utilities and to provide room for continuing the excavation after the temporary decking is erected.

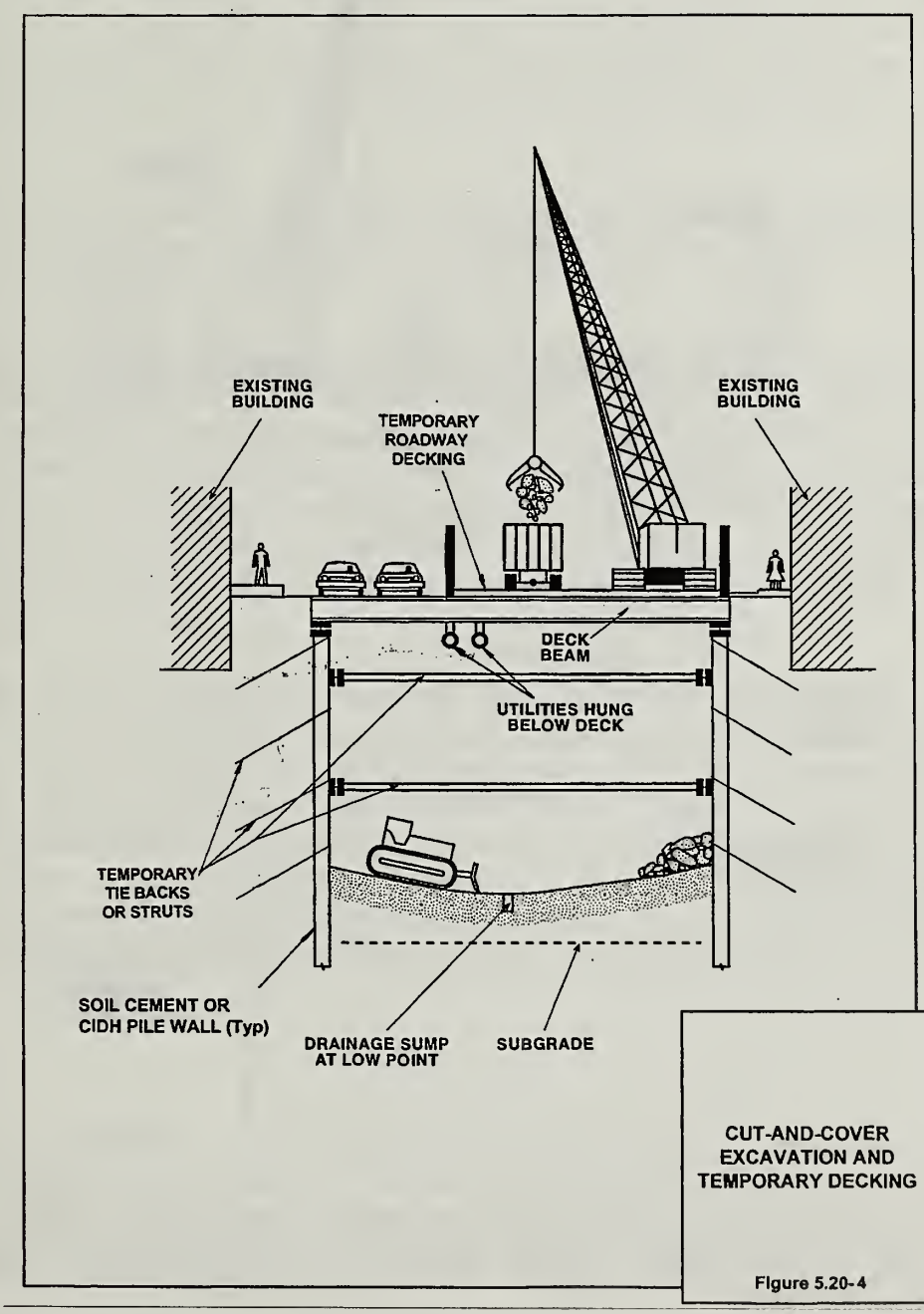
As deck beams are installed, the utilities that can remain in the trench area (e.g., telephone, traffic, electric) would be cradled, picked up, and hung from the deck beams. Sewer lines may exist at this shallow depth and likewise would be hung from the deck beams during the initial excavation stage. Utilities located deeper would be uncovered fully after additional depth of excavation had been accomplished. Sometimes heavy utilities such as large sewer pipes are supported by an auxiliary set of beams spanning between the side walls rather than hanging them from the deck beams. When utilities cannot be relocated outside the excavation or when they are being moved, there is a small chance of damage during excavation, causing a utility outage that can last for a few minutes to a few days. Most of the risk of hitting utilities is caused by actual utility locations being different from those shown on construction drawings. Utility service will be returned as quickly as possible after an outage.

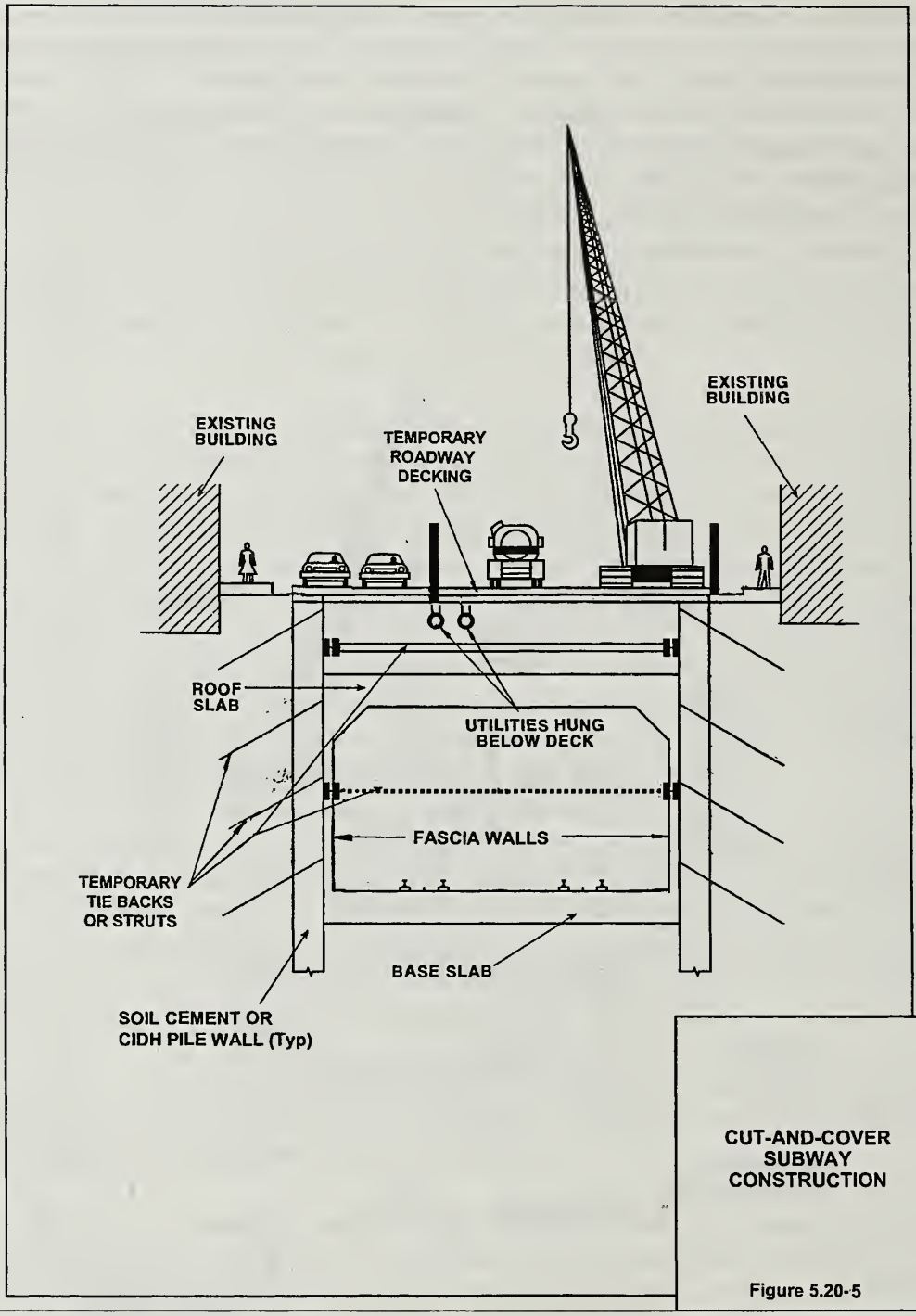
Decking is then placed on top of the deck beams. It is proposed that the decking be set flush with the existing street and sidewalk levels. Roadway traffic can then be restored while excavation will proceed underneath. Figure 5.20-4 illustrates the cut-and-cover excavation and decking process. Decking at cross-streets would be installed in stages to allow at least half of the existing traffic lanes to be maintained. After installation of the deck, full cross-street traffic could be maintained for the duration of construction.

Equipment typically used for decking, excavation, and bracing includes: crawler dozer/loader, water pump, rubber-tired loader/bob cat, pavement breaker, excavator/backhoe, conveyer system, truck, crane, generator/compressor, and fork lift.

**Permanent Structure Installation and Backfill.** After completion of excavation the permanent subway structure would be constructed. In the areas of soft ground encountering Bay Mud, piles would be driven to support the base slab of the permanent structure, followed by construction of the base slab itself. In other locations where the soils under the base slab are more suitable, the base slab would be poured on grade. After the base slab is constructed the vertical fascia walls would be constructed starting at the bottom and proceeding up. The internal struts are removed one by one as the walls of the box structure are raised. The concrete encasement on the internal face of the CIDH piles would be removed back to the face of the steel column. Steel shear connectors would be welded to the column and a reinforced concrete fascia wall would be cast

against the steel columns to act together to form the permanent sidewalls. In the deeper cut sections intermediate level permanent struts constructed of reinforced concrete would be installed between the sidewalls to provide permanent lateral support. Also in wider cuts intermediate columns would be constructed to support the top slab. A top slab constructed of reinforced concrete would be installed last following by backfilling of 8 to 10 feet of earth fill. Road reconstruction would then occur on top of this backfill. Figure 5.20-5 illustrates installation of the permanent subway structure.






Equipment typically used for permanent subway structure construction includes: cranes, concrete trucks, trucks, concrete pumps, welding machines, generator/compressors, rubber-tired loader/bobcat and fork lift.

**Alternative Tunnel Construction.** The use of tunneling methods *is* an alternative to cut-and-cover construction in areas of rock formations. Core drillings were taken in the corridor in 1996, and the rock was identified as "fractured rock." A panel of experts[46] recommended that a "specialized tunneling" technique known as "spiling" be used in this rock. Because the proposed Caltrain Extension Alternatives Tunneling Option includes a larger tunnel (three tracks instead of two) than was proposed in 1996 and passes under historic structures, a tunneling technique known as "*stacked* drift" is now proposed. Due to the poor nature of the rock quality and the large clear spans required for the tunnel structure, this special tunneling method would be employed to minimize the risk of cave-ins during construction. The Tunneling Option is proposed for Station 51+00 (Townsend Street just east of Third Street) to Station 81+00 (Second and Folsom Streets).

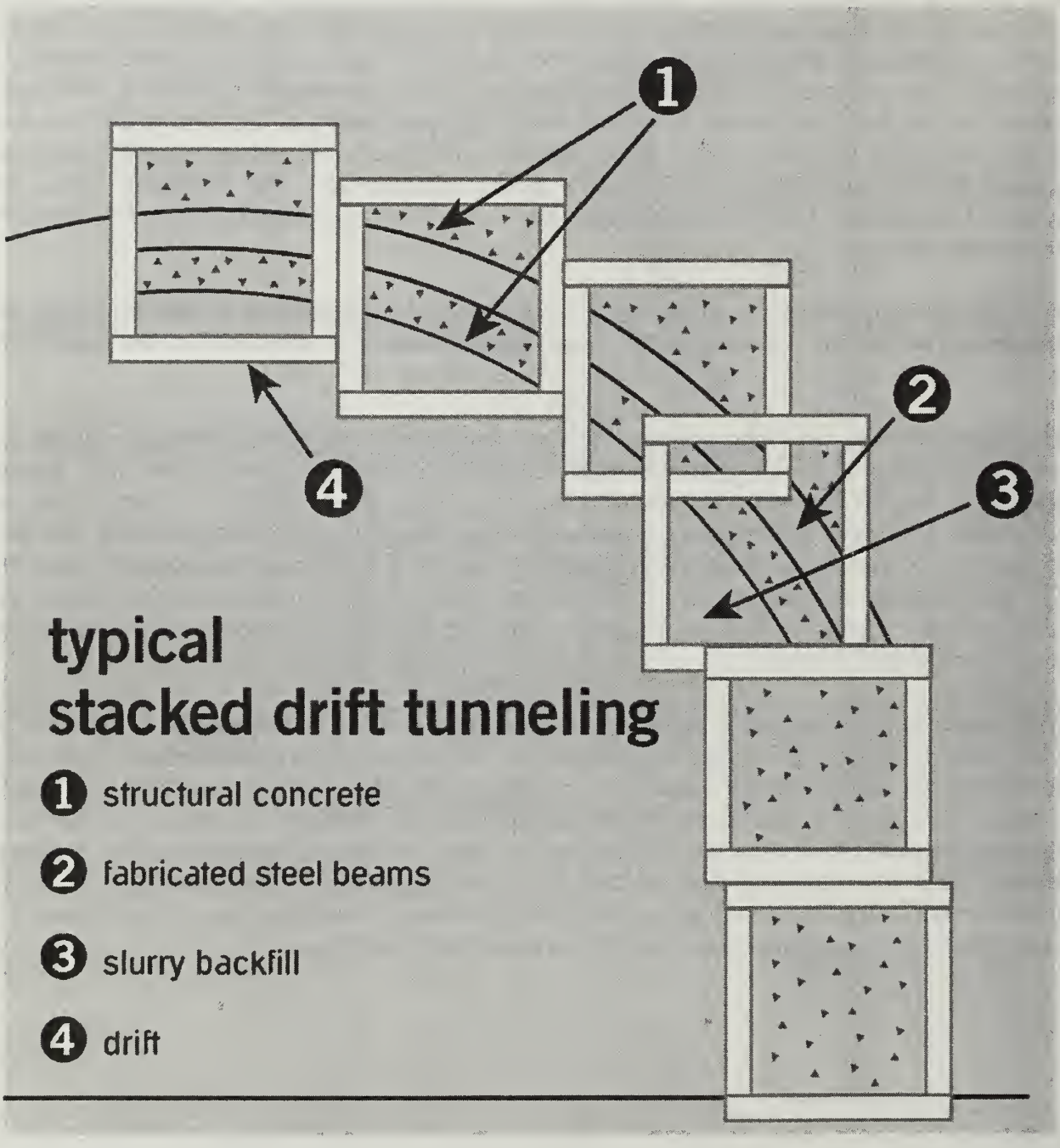
A series of contiguous drifts approximately nine feet wide and about nine feet tall would be constructed around the perimeter of the tunnel sidewalls and roof, starting from the invert and moving towards the crown of the tunnel. (See Figure 5.20-6).

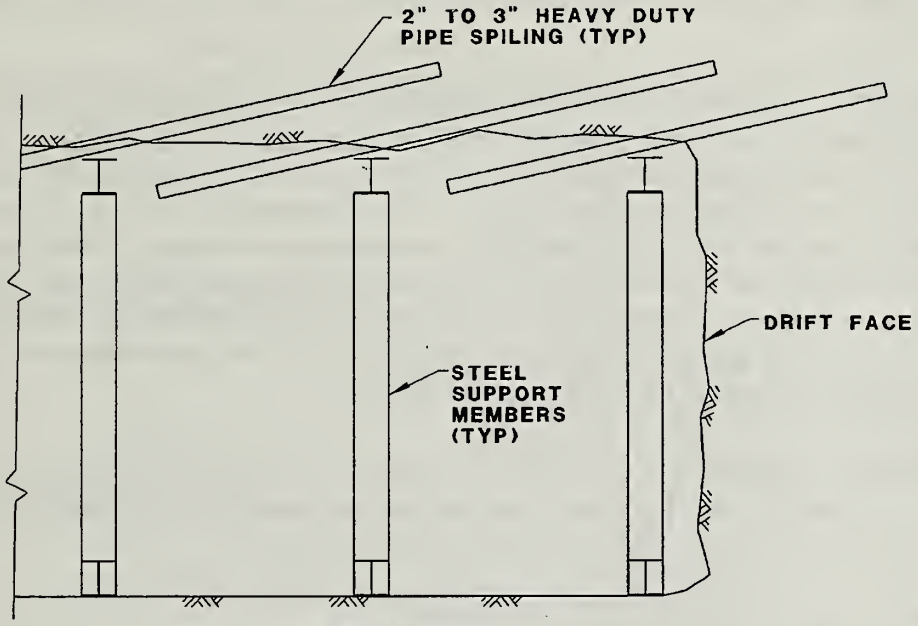
The individual drifts would be excavated by hand mining methods, using spiling as required, to maintain stability of the roof, and using steel support members in combination with timber lagging to support the walls and stabilize the tunnel (see Figure 5.20-7). Once a drift is completed, a specially fabricated segmented ring support beam would be installed in the drift and encased in concrete. Steel reinforcement would be provided to develop the necessary strength. The portion of the drift that will eventually become part of the final tunnel excavation would be filled with slurry concrete that can be easily excavated during tunnel excavation to expose the ring beam and tunnel lining.

After construction of the tunnel support system (concrete encased ring beam), the tunnel itself is excavated in stages using a top heading and a bench. Road headers and other suitable excavating equipment can be used to excavate the rock cavern within the already constructed ring beam. Because the rock is viable, some limited blasting may be required. Access to the tunnel's construction would be from either end and from a vertical access shaft near *Second and Brannan Streets.* From the midpoint access construction of the tunnel would proceed in either direction to speed construction of the tunnel to meet schedule demands. These three access points would be used for equipment and labor access and for egress of excavated material.

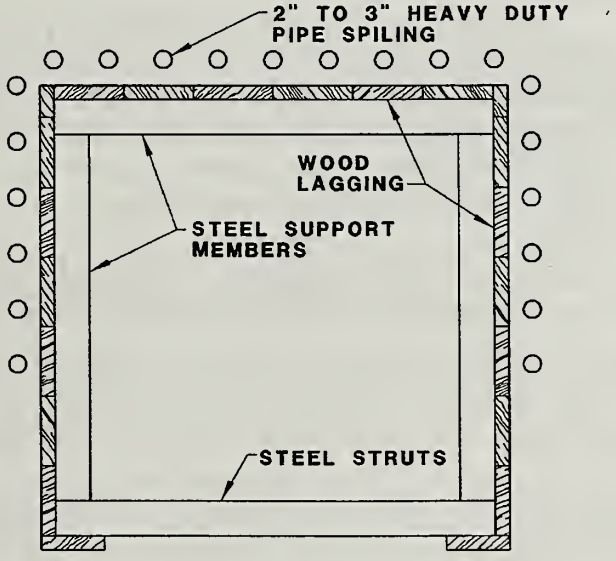
[46] The panel included *P*rofessor Thomas D. O'Rourke of Cornell University, Professor Tor L. Brekke of the University of California, Berkeley, and Mr. Norman A. Nadel, of Nadel Associates, Brewster, New York. The Panel was chaired by Demetrious Koutsoftas, URS, San Francisco, who has extensive experience with development and tunnel projects in the Project Area and a substantial knowledgeable regarding the Project area's geology.

**Figure 5.20-6: Stacked Drift Tunnel Construction**






ELEVATION




SECTION

**Figure 5.20-7: Typical Tunnel Drift Construction**

Equipment used for tunnel construction includes: rubber tired front end loader/bobcats, air compressors, generators/compressors, pneumatic tools, fork lifts, dump trucks, small rubber tired cranes.

**Transbay Terminal and Related Facilities Construction.** Transbay Terminal construction would be very similar to cut-and-cover and retained cut construction methods as it will also make use of soil cement walls and ground anchors. *I*t will differ in that the soil cement walls will be used *only* in the temporary condition. The permanent terminal structure will be constructed inside the soil cement walls as an independent structure. After the permanent structure is constructed the temporary soil cement walls and ground anchors are abandoned in place. After the soil cement walls are constructed then excavation would proceed from top down. Excavation would not proceed more than two to three feet below the level of the next required level of ground anchors until they were installed.

**Related Temporary and Permanent Facilities.** There are proposed facilities to be constructed in the general area south of the Transbay Terminal that provides for the operation of temporary and permanent bus service. These facilities include the following:

- Permanent Transbay Terminal and Access Ramps
- Temporary Transbay Terminal
- Permanent Offsite Bus Storage and Access Ramps

All bus access ramps would be aerial structures most likely constructed of reinforced concrete. In areas with shallow underlying rock, the foundations would be concrete spread footings. In softer underlying soils, pile supported foundations would be constructed. Falsework would be required to support the forms for constructing the elevated structures. Falsework would span over existing roadways to be kept them open during construction.

The temporary Transbay Terminal and permanent offsite bus storage areas are simple facilities constructed on existing grades. Existing minor improvements on these sites would be removed and the sites graded for the new improvements. New improvements would consist mainly of paving for bus storage or travel ways. In the temporary terminal pedestrian platforms and walkway areas would be constructed along with some with canopy shelters.

Equipment for construction of these facilities would include: pile drivers, trucks, dump trucks, air compressors, graders, front end loaders, excavators, backhoes, and small rubber tired cranes.

**Quantity of Excavated Materials.** Table 5.20-4 identifies the estimated number of cubic yards of material to be removed during construction of the track corridor alignment and Transbay Terminal. Excavation quantities for the other related projects to the Transbay Terminal can be considered as negligible in comparison to the below quantities.

**Table 5.20-4: Estimated Amounts of Excavation Materials**

| Construction Site Location | Estimated Cubic Yards [a] |
|---|---|
| **Second-to-Main Alternative (Retained Cut, Cut and Cover)** | |
| Ex. Yard and Townsend Street | 729,400 |
| *Second* Street to Transbay Terminal | *999,000* |
| Transbay Terminal | 658,100 |
| Transbay Terminal to End | 322,200 |
| **Total** | ***2,708,700*** |
| **Second to Mission Alternative (Retained Cut, Cut and Cover)** | |
| Ex. Yard and Townsend Street | 729,400 |
| *Second* Street to Transbay Terminal | 999,000 |
| Transbay Terminal | 658,100 |
| Transbay Terminal to End | 486,800 |
| **Total** | **2,873,300** |
| **Second-to-Main Alternative (Retained Cut, Cut & Cover, Tunneling)** | |
| Ex. Yard and Townsend Street | 729,400 |
| Tunnel from Townsend to Second Street at Folsom Street | *336,000* |
| Second Street at Folsom Street to Transbay Terminal | 301,300 |
| Transbay Terminal | 658,100 |
| Transbay Terminal to End | 322,200 |
| **Total** | ***2,347,000*** |
| **Second-to-Mission Alternative (Retained Cut, Cut & Cover, Tunneling)** | |
| Ex. Yard and Townsend Street | 729,400 |
| Tunnel from Townsend to Second Street at Folsom Street | *336,000* |
| Second Street at Folsom Street to Transbay Terminal | 301,300 |
| Transbay Terminal | 658,100 |
| Transbay Terminal to End | 486,800 |
| **Total** | ***2,511,600*** |

Note: [a] This column includes an estimated 1.15 expansion factor for soil and 1.5 expansion factor for rock and demolished concrete due to bulking upon excavation/demolition.

**Street Reconstruction.** To fully restore permanent street traffic, temporary decking would be removed, the remainder of cut-and-cover sections would be backfilled, permanent utility restoration would occur, and the permanent street improvements would be installed. With restoration of roadway pavement and vehicular traffic, the surface work on the project would be completed and continuing activity involving subway finishes and equipment installations (e.g., installation of tracks, power, signals, and communication systems) could continue beneath the surface with minimal disruption to street use by vehicles and pedestrians.

Equipment typically used for street reconstruction includes: rubber-tired loaders/ bobcat, roller/ compactors, dump trucks, and paving machines.

### 5.20.3 CONTRACTOR WORK AREAS

Contractor work areas (or construction staging areas) would be needed for the surface, retained cut, and cut-and-cover construction segments of the proposed extension. Following are the proposed contractor work areas:

1. East of Seventh Street, between Berry and Townsend Streets at the westernmost end of the existing Caltrain Yard.
2. North of Townsend Street, east of Clarence Place and west of Stanford Street, at the site of buildings that would be taken and demolished for the Caltrain Downtown Extension.
3. The Southwest quadrant of the intersection of Second and Brannan streets, at the location of buildings to be demolished for the construction of the Caltrain Downtown Extension.
4. The northeast quadrant of the Howard Street/Second Street intersection, at the site of buildings to be demolished for the construction of the Caltrain Downtown Extension.
5. The parking lot west of Main Street between Howard and Mission streets.

Contractor work areas, if alternative tunneling construction methods were used, would be as follows. There are fewer areas due to the reduction in demolition of existing buildings.

1. East of Seventh Street, between Berry and Townsend Streets at the westernmost end of the existing Caltrain Yard.
2. *North* of the intersection of Second and Brannan Streets.
3. The northeast quadrant of the Howard Street/Second Street intersection, at the site of buildings to be demolished for the construction of the Caltrain Downtown Extension.
4. The parking lot west of Main Street between Howard and Mission streets.

Activities that would occur at these sites primarily include stockpiling of materials and storage of equipment. It is expected the contractor would rent local office space for their construction office to house administrative staff. Equipment employed for cut-and-cover is typically heavy duty, high volume machinery. Such equipment requires certain amounts of space when standing still, more for turning, and additional for maneuvering.

### *5.20.4 ANCILLARY FACILITIES*

*Ventilation and emergency access shafts will be required for the tunnel portion of the Caltrain Downtown Extension. Following is a discussion of anticipated locations and impacts of these facilities. The final locations for these shafts are subject to change during final design.*

*Tunnel shafts and ventilation systems provide the following capabilities:*

- ***Heat Removal*** *- During normal conditions, tunnel ventilation is achieved by natural ventilation consisting primarily of train piston-action induced airflows. Fans housed in shafts are provided to augment the natural ventilation provided by the train piston action during*

*normal operations and, when necessary, provide the primary means of limiting the tunnel temperatures when train piston action induced airflows are no longer present.*

- ***Smoke Control*** *- An "emergency" mode of operation for smoke control and discharge is provided using remote and overriding local fan controls.*
- ***Air Movement (piston action) Relief*** *- Vent shafts are typically provided at each end of underground stations to reduce excessive air movement within stations due to piston-action of trains*
- ***Emergency Egress*** *– National Fire Protection Association Standard (NFPA) 130 requires exit shafts to the surface at maximum 2,500 foot centers (reference NFPA 130 2003, paragraph 6.2.4.2). Where practical, ventilation shafts may also include emergency stairways. The portal at the Townsend station may be considered an exit since this station is proposed as an open cut section.*
- ***Air Intake/Exhaust*** *– In the case of a dead end tunnel, a means of providing an air intake and/or exhaust shaft is necessary for the ventilation system to function properly.*

***Ventilation Shafts.*** *For the Locally Preferred Alternative, it is assumed that ventilation shafts housing fans and bypass dampers would be provided at each end of the new Transbay Terminal These shafts would house a minimum of two reversible fans and associated equipment consisting of sound attenuators and fan dampers. Bypass dampers would also be provided for additional air movement (piston-action) relief. The ventilation equipment would be located above the train tracks. The discharge of each shaft would be incorporated into the terminal structure. The foot print for these facilities would be approximately 200 square feet (10 by 20 feet).*

*Air intake/exhaust shafts would also be located in the sidewalks along Main Street just north of Harrison, near the end of the proposed tail tracks. These shafts would also include emergency exits. Since the Townsend Street Station is in an open cut, ventilation shafts would not be required at this station.*

***Emergency Exit Shafts.*** *In addition to the emergency exits assumed north of Harrison Street in the Main Street sidewalks as described above, tunnel emergency exit shafts are also assumed at Second and Brannan Streets and at Second and Howard Streets. With emergency exits also assumed at both ends of the Transbay Terminal, this would result in an average distance between shafts of approximately 1,610 feet – within the requirements of NFPA 130. The shafts would be constructed as part of the cut-and-cover construction for the Second at Folsom and Main at Harrison locations and as part of the tunnel construction access shaft assumed at Second and Brannan Streets. At completion, the shafts would lead to a metal door located in and flush with the sidewalks along Second and along Main Streets. These emergency access shaft doors would be locked from the surface and would open from the underside leading from exit stairways in an emergency.*

***Emergency Generator.*** *A diesel-powered emergency generator, to operate critical terminal functions (e.g., emergency lighting, escalators), would be installed at one end of the terminal. This facility would also need to be vented to the surface. The generator would need to be tested, typically at one month intervals, so noise mitigation would be provided.*

***Environmental Impacts.*** *No long-term impacts (visual, noise, etc.) would be associated with the anticipated emergency exits given that they would be flush with the sidewalk surface. Construction impacts from these facilities are described below for the cut-and-cover construction that would occur at these locations.*

*It is assumed that the fan located at the west end of the terminal would be operated only during emergencies. During normal operations (i.e., trains moving more or less as scheduled), piston action is typically sufficient to prevent heat build-up.*

*Local codes will require some means of ventilation for the tail track, which would be provided by the fan located at the east end of the terminal. It is assumed that one of the two fans serving the tail tracks would be operated during periods when the light train servicing is occurring. Both fans would operate if an emergency occurred. As an option, both fans could be operated at a reduced speed.*

*Walls would be located around the surface access for both fan facilities and around the emergency generator to mitigate noise and prohibit public access to the ventilation equipment for security purposes. Noise walls would be designed to assure adherence with FTA noise levels. Land uses immediately surrounding the new terminal at either end are primarily commercial/office.*

*The land uses immediately surrounding the vent structure and emergency exits at Main just north of Harrison are also commercial/office. This shaft would operate as an air intake/exhaust shaft to provide make-up air for the tunnel ventilation fans installed at the terminal. The shaft would be located near the far end of the tail track to allow fan induced airflow to sweep the entire length of the tail track tunnel. This shaft would terminate at the surface, under local sidewalks, with a grating. Air/intake shaft mechanical equipment would be limited to a damper that opens whenever the tunnel ventilation fans operate and closes upon fan shutdown. Given the surrounding land uses and facility operation, no environmental impacts are anticipated.*

### 5.20.5 CONSTRUCTION PHASING

Figure 5.20-8 shows the schedule for construction of the Transbay Terminal and the Caltrain Downtown Extension.

***Figure 5.20-8: Estimated Construction Phasing for Transbay Terminal and Caltrain Downtown Extension [a]***

| Calendar Years | 2004 | | 2005 | | 2006 | | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Activity / Months | 1-6 | 7-12 | 13-18 | 19-24 | 25-30 | 31-36 | 37-42 | 43-48 | 49-54 | 55-60 | 61-66 | 67-72 | 73-78 | 79-84 | 85-90 | 91-96 |
| Operations Analysis, Preliminary Engineering, Geotechnical Engineering | | | | | | | | | | | | | | | | |
| Program Review/Value Engineering | | | | | | | | | | | | | | | | |
| Final Design & Permitting – Transbay Terminal | | | | | | | | | | | | | | | | |
| Final Design & Permitting – Caltrain Extension | | | | | | | | | | | | | | | | |
| Acquire Property, Design, Construct Temporary Terminals (Transit and Greyhound) | | | | | | | | | | | | | | | | |
| Acquire Property & Demolish Buildings along Caltrain Extension | | | | | | | | | | | | | | | | |
| Design and Relocate Utility Lines along Caltrain Extension | | | | | | | | | | | | | | | | |
| Construct Surface Rail & Improvements at Caltrain Fourth and Townsend Yard | | | | | | | | | | | | | | | | |
| Construct Cut-and-Cover and Retained-Cut – Caltrain Extension | | | | | | | | | | | | | | | | |
| Reconstruct Streets | | | | | | | | | | | | | | | | |
| Construct Caltrain Tunnel | | | | | | | | | | | | | | | | |
| Construct Caltrain Track & Systems Facilities | | | | | | | | | | | | | | | | |
| Demolish Existing Transbay Terminal & Ramps, Construct New Terminal & Ramps | | | | | | | | | | | | | | | | |
| Construct Permanent Off Site Bus Storage Facility | | | | | | | | | | | | | | | | |

[a] Assumes West Ramp, Second–to–Main, Tunnel Option

## 5.21 CONSTRUCTION IMPACTS

The following sections evaluate the impacts and mitigation measures for the construction scenarios described above.

### 5.21.1 TRANSIT OPERATIONS

This section reviews the effects of Terminal/Extension Project construction on transit operations. Construction of the Transbay Terminal and underground Caltrain Station would require the establishment of a temporary bus terminal, the rerouting of transit lines, and the reconfiguration of roadways surrounding the temporary bus terminal. Transit operations on other roadways in the project area would also likely be affected and are addressed at the end of this section.

The impacts assessment is based upon preliminary planning for the temporary terminal as described in SMWM's Working Paper 12 "Terminal Design Modifications and Refinements" and in Section 3 of Arup's Working Paper 7.0 Pre-Concept Engineering Report.

#### 5.21.1.1 Temporary Terminal Operations

The temporary terminal would be built on the single square block defined by Main/Beale/Folsom/Howard Streets. The core of the temporary terminal would serve AC Transit's transbay operations and midday bus storage. The perimeter of the terminal would accommodate Muni drop-off, layover, and pick-ups as well as Golden Gate Transit pick-ups. Greyhound buses would board and alight passengers at a separate, adjacent terminal on the west side of Beale Street between Folsom and Howard Streets (see Figure 5.21-1).

New overhead power distribution wires would be required for the rerouting of Muni Trolley buses on Folsom Street between Beale and Main; Howard Street between Beale and Main; Main Street between Howard and Folsom, Beale Street between Mission and Folsom; and Fremont Street between Mission and Howard.

***Proposed Access to/from the Temporary Terminal for AC Transit Buses***

*In response to public comment regarding the need to reduce overall project costs, the co-lead agencies have identified alternate AC Transit bus access to the temporary terminal to avoid the need for a temporary bus ramp between the Bay Bridge and the temporary terminal during operation of the temporary facility. Without a temporary bus ramp, the buses exiting the freeway would use local streets to gain access to the temporary terminal between Main, Beale, Folsom, and Howard Streets. AC Transit buses exiting the I-80 freeway would go north up Fremont from the Harrison Street ramp, turn east on Folsom and proceed eastbound toward the temporary terminal. For the return trips, there would be a contra-flow lane along Folsom from Main Street to Essex Street for buses exiting the terminal. Buses would then have a protected left-turn movement from Folsom onto Essex Street. Once on Essex, the buses would travel on a dedicated*

*bus lane toward the freeway on ramp. Figure 5.21-2 shows these access routes for buses while approaching and leaving the temporary terminal.*

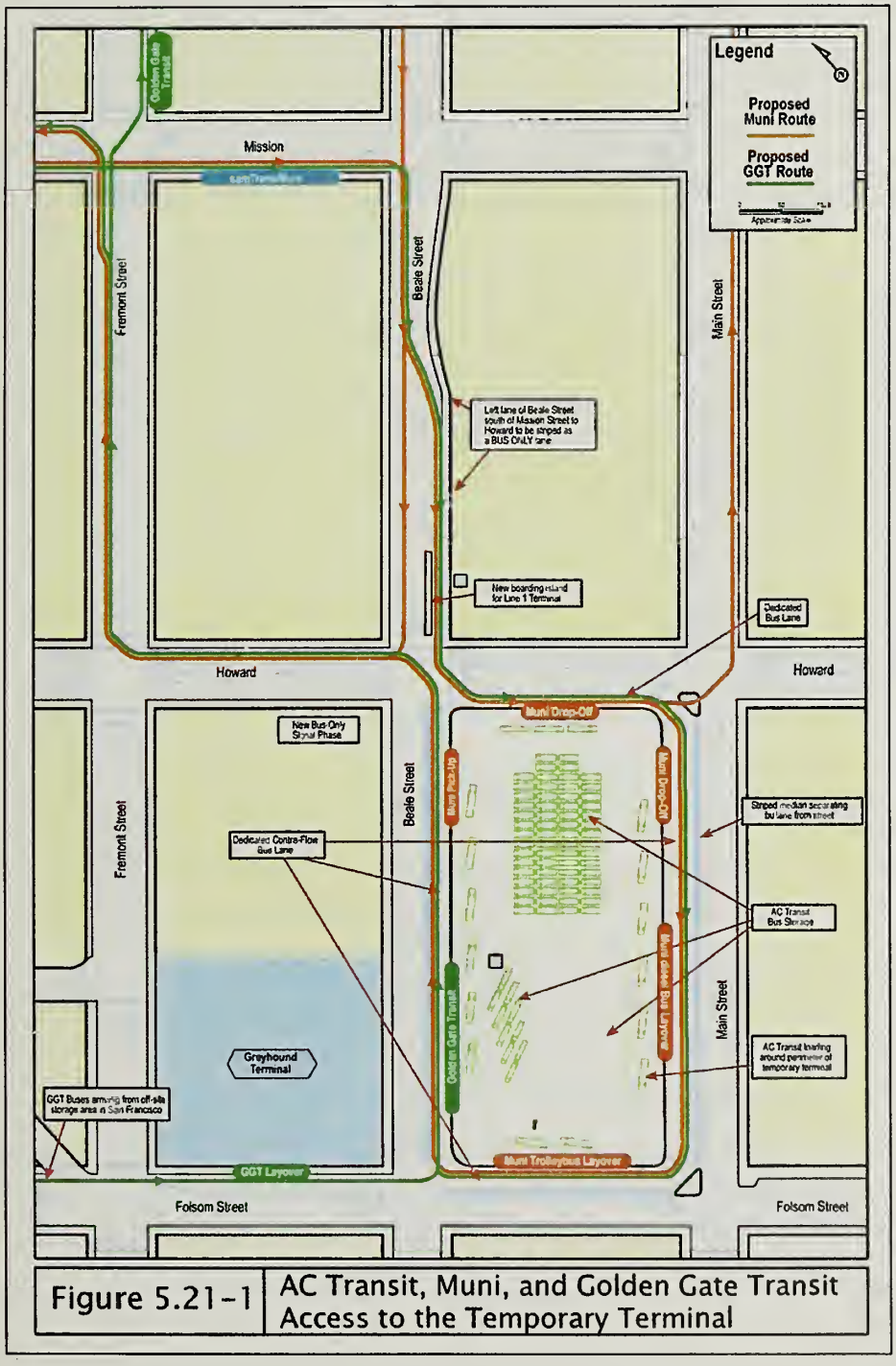



**Figure 5.21-1** AC Transit, Muni, and Golden Gate Transit Access to the Temporary Terminal

*Traffic turning movement data for 2000 and 2020 were obtained from an earlier study done by Wilbur Smith Associates. The traffic volumes for 2006 were determined by linear interpolation. Traffic analysis was done for the P.M. peak period – from 5:00 to 6:00 p.m. AC transit bus counts were obtained from AC Transit, through their check sheet for buses at Transbay Terminal. Golden Gate buses were assumed to add 30 buses per hour to the eastbound traffic on Folsom Street as they returned from the off-site storage in the P.M.-peak period. Using SIGNAL 94 from TEAPAC, key intersections were analyzed for the "with" and "without a temporary ramp" condition to the temporary terminal. The analysis year for all construction detour analyses was 2006 – the midpoint of the construction schedule.*

*Table 5.21-1 summarizes the intersection traffic and level of service data on the selected five intersections near the temporary terminal, with and without the additional buses and with contra-flow lane. For the no-ramp condition, there were no intersections that would degrade to Level of Service E or F assuming the operation of the bus lane along Folsom Street. At intersections where the contributions of the additional buses and the contra-flow lane were found to be adverse, traffic would be added to movements that would continue to operate satisfactorily.*

*There are two intersections in the Bay Bridge queue, however, that are projected to operate at LOS F both with and without the bus lane: First and Folsom, and Essex and Harrison. With the contra-flow lane, First and Folsom would have a slightly higher V/C ratio while Essex and Harrison would be about the same. The increase in the V/C from 1.35 to 1.38 at First and Folsom is not an adverse effect under the City and County of San Francisco criteria. It should be noted that at this intersection, the southbound traffic on First Street represents the major volumes at the intersection, thus contributing heavily toward the high V/C at the intersection. The east-west bound traffic on Folsom is much lower, and the buses, although an addition to the existing traffic during 2020, would travel on a dedicated lane, westbound on Folsom. Hence, the contribution to the traffic conditions from the buses in the dedicated lane would not be severe.*

*At the Essex and Harrison intersection, the northbound lanes of Essex Street that currently have very light traffic would be converted to southbound lanes. With two mixed-flow lanes and a dedicated bus lane in the southbound direction on Essex, the V/C ratio at Essex and Harrison would slightly improve from the existing condition.*

*As a result, the traffic generated by the additional buses and contra-flow lane would not represent a considerable contribution to the existing conditions and there would be no severe adverse traffic impacts at these intersections.*

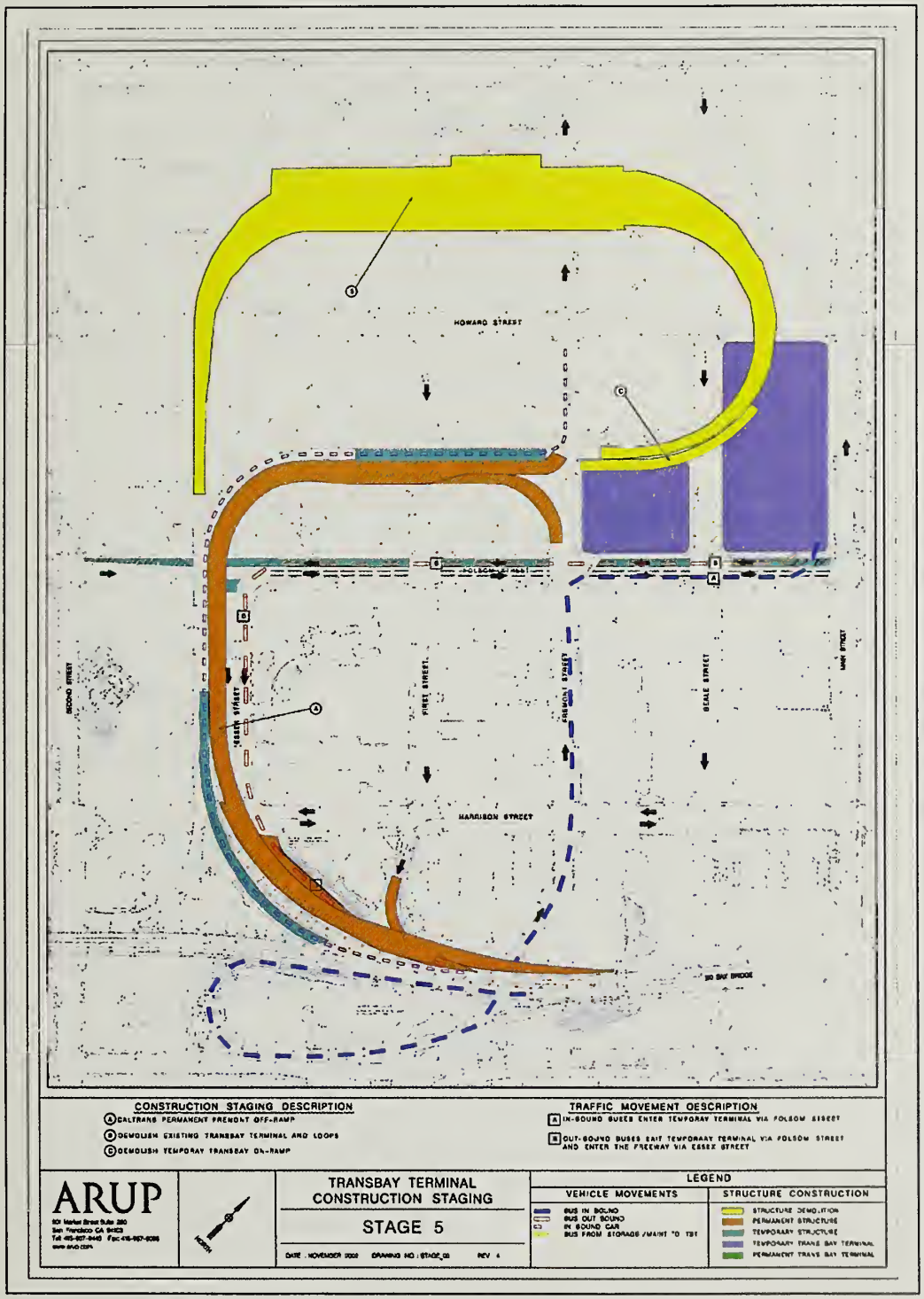



**Figure 5.21-2: AC Transit Access Routes to/from the Temporary Terminal**

**Table 5.21-1: Level of Service Calculations for Contra-Flow Bus Lane from Temporary Bus Terminal to Bay Bridge via Folsom**

| | *2006 Conditions with and without the Additional Buses and Contra-Flow Bus Lane* | | | | | |
|---|---|---|---|---|---|---|
| | *Without Buses* | | | *With Buses* | | |
| *Intersection* | *V/C* | *Delay* | *LOS* | *V/C* | *Delay* | *LOS* |
| *Main and Folsom* | *0.29* | *6.6* | *B* | *0.86* | *35.5* | *D* |
| *Beale and Folsom* | *0.47* | *8.4* | *B* | *0.65* | *10.4* | *B* |
| *Fremont and Folsom* | *0.34* | *7.4* | *B* | *0.43* | *6.3* | *B* |
| *First and Folsom* | *1.35* | *>60** | *F* | *1.38* | *>60** | *F* |
| *Essex and Folsom* | *Unsignalized Intersection* | | | *0.8* | *15.8* | *C* |
| *Essex and Harrison with two southbound mixed flow lanes* | *1.25* | *>60** | *F* | *1.22* | *>60** | *F* |
| *Fremont and Harrison* | *0.77* | *13.1* | *B* | *0.78* | *14* | *B* |

**LOS is based on V/C ratios for intersections with V/C > 1.*
*Source: Parsons, July 2003.*

### 5.21.1.2 Transit Operations

The creation of a temporary Transbay Terminal would allow uninterrupted service for AC Transit, Muni, Golden Gate Transit, SamTrans, and Greyhound while the permanent facility is under construction. Each of these transit services would be required to modify operations during the operation of the temporary terminal.

**AC Transit.** The temporary facility is designed to fully accommodate AC Transit operations. Sufficient midday bus storage would be provided within the temporary terminal; therefore, AC Transit would not incur additional operating costs due to deadheading. AC Transit buses would circulate counterclockwise around a central bus parking lot. Surrounding the bus right of way would be 16 saw tooth bays. Passengers would board and alight from the perimeter sidewalk around the terminal and no internal crosswalks would be needed.[47]

The operation of AC Transit in the temporary terminal was analyzed using a local area network simulation model, VISSIM. The analysis determined that the temporary terminal had sufficient capacity for AC Transit to operate and store buses during afternoon peak conditions when occupancy of the terminal's center area, including the buses operating within the AC Transit storage/staging area, is highest. The study also demonstrated there would be sufficient bus bays available in the temporary facility during maximum occupancy. Maximum queues (8 buses) in the circulation area would dissipate in about one minute.[48]

[47] Arup, Working Paper 7.0 Pre-Concept Engineering Report, p. 23
[48] SMWM Working Paper 12 Terminal Design Modifications and Refinements, p. 68 -71

**Muni.** Muni routes currently serving the Transbay Terminal include lines 5, 6, 38, and 38L. They would be rerouted to board and alight passengers around the periphery of the temporary terminal. Muni lines 2 and 3 are also expected to serve the temporary terminal.

Terminal-bound Muni routes would be extended an extra one or two blocks on Market Street, proceed south down Beale Street, and continue along Howard Street to access the temporary facility. Buses would circulate clockwise around the terminal's perimeter, enabling passengers to load on the opposite side of the same curb/loading area used by AC Transit buses circulating counterclockwise within the terminal. Muni trolley buses would use drop-off bays along the south side of Howard Street and lay over along Folsom Street at the south end of the temporary terminal. Diesel operated buses would use two drop-off bays located along Main Street. All Muni vehicles would board passengers at the four northernmost bays along Beale Street.

*Muni estimates that the additional annual operating and maintenance costs associated with the Temporary Transbay Terminal will be just under $1 million in FY 2000 dollars. These additional costs are expected to result from the rerouting of the 2,5,6, and 38/38L lines.*

Simulation modeling demonstrated that there would be adequate capacity within the facility to accommodate Muni's existing service during peak periods. The maximum queue exiting the terminal at Beale and Howard Streets would be four vehicles. This assumes the addition of a bus-only left-turn phase to the intersection's existing signal.[49]

**Golden Gate Transit.** The temporary terminal would accommodate Golden Gate Transit staging, boarding and alighting but not midday storage. Since AC Transit is expected to use the full storage capacity of the temporary terminal, Golden Gate Transit would require an off-site storage location and likely incur additional operating costs due to deadheading between the location and the temporary terminal. The preferred location of an off-site storage area and a rerouting plan have not been identified. Golden Gate is currently evaluating alternative bus staging areas with the pending loss of its lease for the current storage site. The lease termination is not an effect of the proposed project.

Buses would access the temporary facility proceeding eastbound on Folsom Street and turning left onto Beale Street. Passengers could board at any of three bays reserved for Golden Gate along the eastern edge of Beale Street. An additional bay would be available on Beale Street for use by either Muni or Golden Gate Transit. A staging area for buses waiting to board and alight passengers would be available along the northern edge of Folsom Street between Fremont and Beale Streets. The precise access route for Golden Gate Transit to the temporary terminal will depend on the location chosen for its off-site storage area.

[49] SMWM, p.72.

**Greyhound.** Greyhound buses would not be accommodated within the temporary terminal but have a separate boarding area on the southern end of the block bounded by Beale/Fremont/Folsom/Howard Streets. The proximity of this location to the temporary terminal would facilitate connections between Greyhound, AC Transit, and Muni.

**SamTrans.** During the construction phase, SamTrans express bus service would operate via Mission, Beale, Folsom and Main Streets to an endpoint terminal on Beale between Howard and Folsom, or as an alternative, on Main between Folsom and Howard. Buses would alight passengers at all bus stops prior to the endpoint. Leaving the endpoint, buses would be in service and stop at all bus stops for passenger boarding. This operation would result in the elimination of 11 parking spaces on the south side of Mission Street between Fremont and Beale Streets.

### 5.21.1.3 Changes to Surrounding Road Network

In order to facilitate movements to and around the temporary transbay facility, several physical and operational improvements would be made to the surrounding roadways. These changes are shown in Figures 5.21-1 *and 5.21-2.* The effects on bus operations are described by arterial.

**Beale Street.** The segment of Beale Street between Howard and Folsom would be reconfigured to accommodate a northbound contra-flow dedicated bus lane and a separate lane for bus loading and staging along the curbside of the temporary Terminal. The contra-flow bus line would be used by both Muni and Golden Gate Transit. The northernmost end of the bus-loading lane would be used for Muni boarding and alighting. The southernmost end would be used by Golden Gate Transit. New overhead power distribution wires would be added to support Muni trolleybuses.

Reconfiguring Beale Street would require the elimination of two southbound traffic lanes and 12 curbside parking spaces on Beale Street. A four-foot-wide median would be built between the two remaining southbound lanes and the new bus lane. Additionally, the casual carpool lane, currently on the east side of Beale Street, would be relocated to the west side of the street.

The segment of Beale Street between Mission and Howard would also be reconfigured to accommodate a new boarding island for Muni's Line 1 and a southbound bus-only lane. New overhead wires would also be provided above this segment to accommodate Muni trolleybuses.

**Folsom Street.** Folsom Street between Beale and Main Streets would be reduced from four lanes eastbound to two lanes of eastbound traffic with the addition of a westbound contra-flow bus-only lane for Muni and Golden Gate Transit. The bus lane and the traffic lanes would be separated by a four-foot-wide striped median. Nine automobile parking spaces would be removed along the north curb of Folsom Street and replaced with a bus loading/staging lane. The bike lane and parking on the south side of Folsom would not be changed. New overhead wires would be added to support Muni trolleybuses.

**Main Street.** Main Street's three northbound traffic lanes between Howard and Folsom Streets would be changed to provide two lanes northbound and a southbound contraflow bus-only lane. All 48 motorcycle parking spaces and nine automobile spaces would be removed from the west side of Main Street and replaced with a curbside bus loading/staging lane. Overhead wires would be installed to accommodate Muni trolleybuses.

**Howard Street.** Existing traffic lanes on Howard Street, the northern border of the temporary terminal, would not be changed during construction of the new Transbay Terminal but on-street parking would be removed between Beale and Main Streets. The north parking lane would be converted to provide another westbound travel lane and the south parking lane would become a bus loading/unloading area for Muni.

### 5.21.1.4 Other Construction Impacts

Construction of the new Transbay Terminal will also affect transit operations on other roads in the study area.

**Mission Street.** Muni, Golden Gate Transit, and SamTrans would continue to operate along Mission Street in front of the terminal site during construction. However, construction generated traffic could potentially result in temporary delays for these operations. *The Second-to-Mission Alternative would also require block-by-block closures on Mission Street to construct the cut-and-cover subway between Beale Street and The Embarcadero. Muni's Line 14 line currently operates on Mission Street and would be rerouted or turned back temporarily in sequence with construction activity. The bus circulation via a contra-flow bus lane on Main Street for the temporary terminal would not be affected since the buses would be moved back to the new Transbay Terminal before the block between Howard and Folsom would be affected.*

**Second Street.** The cut-and-cover construction of the Caltrain rail tunnel would require block-by-block closures of Second Street. Muni's Line 10 line currently operates on Second Street and would be rerouted temporarily in sequence with construction activity.

**Third Street.** In order to accommodate construction on Second Street, Third Street may be restriped to accommodate southbound vehicular traffic. The additional traffic could affect the performance of Muni's service on Third Street, including lines 15, 30, 45 and 81x.

***Main Street.*** *The Second-to-Main Alternative would also require block-by-block closures on Main Street to construct the cut-and-cover subway from south of Howard Street to just south of Harrison Street. Muni's 1, 80X, and 82X lines and multiple Golden Gate lines currently operates on Main Street and would be rerouted temporarily in sequence with construction activity.*

## 5.21.2 VEHICULAR TRAFFIC

### 5.21.2.1 Construction Trucks and Staging Areas

The number of construction trucks projected to be on the city streets for this analysis is based on the estimated volume of debris to be removed, the amount of materials to be brought in, the average capacity of the trucks, and the approximate time of operation. The following analysis is for the Cut-and-Cover Second-to-*Mission* Alternative, which has *2.8* million cubic yards of material to be excavated *(Table 5.20-4)*. This option represents a "worst case analysis." Fewer trucks would be required for the Second-to-Main Alternative. Moreover, substantially fewer trucks would be required for the Tunneling Option for either alternative, in that the tunneling option would have sizably less excavated material. *The Locally Preferred Alternative is the Second-to-Main Tunneling Option, which would generate about 20 percent less total excavated material than assumed in this worst case analysis.*

For the Second-to-*Mission* Cut-and-Cover Option analysis, the construction period is assumed to be two years, with an average hauling period of eight hours per day for 360 days per year less ten percent. Truck size is assumed to be 20 cubic yards. Soil is assumed to expand by 15 percent and rock by 50 percent. In general, it is assumed that spoils will be hauled by truck to the Caltrain yard adjacent to Seventh and Townsend and loaded onto trains for disposal out of the area. *Disposition of the excavated materials will be the responsibility of the contractor. Any hazardous materials will need to be disposed of according to federal and state laws and regulations governing its hauling and disposition (see Section 5.21.15.). The actual location for the use (e.g., as fill material) or disposal of non-hazardous excavated materials will depend on the demand for such materials at the time of construction and/or the ability to dispose of these materials at a site to be determined by the contractor.* Construction materials would be brought in only by truck.

The planned staging areas are the following:

- Portions of the Seventh and Townsend yard,
- Along the corners of the Second Street alignment between Brannan and Townsend,
- Northeast quadrant of Howard and Second, and
- Northwest quadrant of Howard and Main.

The volume of haul debris has been estimated based on planned dimensions of the cut and station (Table 5.21-*2*). For segment No. 1, adjacent to the yard and Townsend Street, only 40 percent of the trucks are assumed to use City streets; the remainder are assumed to stay internal to the yard in conveying material to trains for disposal. For the remaining three segments, all material is assumed to be hauled by truck to the yard. This is a conservative assumption because rail may be used to directly haul almost all of the material from segments Nos 1 and 2 instead of only 60 percent of No. 1. Trucks bringing construction materials are estimated to be ten percent of those removing excavated material.

**Table 5.21-2: Projected Construction Truck Volumes**

| Construction Segment | Excavation Volume (cu yd) | Trucks/hr* (Round Trips) | Minutes/Truck |
|---|---|---|---|
| No. 1. Yard & Townsend St. | *292,000*** | *1* | *42* |
| No. 2. Second St. to Terminal | *999,000* | *16* | *3.8* |
| No. 3. Terminal | *658,000* | *8* | *7.6* |
| No. 4. *To end of Mission* St. | *487,000* | *6* | *10* |
| **Total** | ***2,436,000*** | ***31*** | ***1.9*** |

**Notes:**
*Also includes trucks carrying construction materials to sites.
***Reduced by 60% to account for rail hauling.*

Source: Parsons Corporation, September *2003*

Under these assumptions, it was estimated that a total of *31* construction truck round trips per hour would be required to haul the debris or bring in construction materials. But due to the phasing of the construction, with segments Nos. 1 and 4 potentially being constructed in parallel and segments Nos. 2 and 3 being constructed later, the maximum number of trucks that would be circulating would be *7* trucks/hour for Nos. 1 and 4 combined and *24* trucks/hour for Nos. 2 and 3 combined. Since the process would be a continuous cycle in which trucks would be arriving and departing, it is projected that, on the average, there would be between *14* and *48* construction truck trips on the local street network during each operating hour. These trucks would be operating on several different streets and arriving or departing from several different construction sites, as listed above. However, under the assumption that most of the excavated material would be hauled away by train, all of the haul trucks would converge at Seventh and Townsend to load the spoil onto trains.

### 5.21.2.2 Truck Routes

Delivery trips from the staging areas along the alignment are combined with the excavation removal. Truck routes by segment would be as follows:

1. Yard and Townsend Street—Trucks will circulate from the yard to Seventh to Brannan to Fourth, Third, or Second and back to Townsend to yard. The volume will be *1* truck/hr. This pattern combines with No. 4 to give a total of *7* trucks per hour.
2. Second to Terminal—Trucks will circulate up Seventh to Brannan to Third, cross over to Second and return down Second to Townsend to Seventh and yard. The volume will be *16* trucks/hr. It is sequential to No. 1/No. 4 and parallel No. 3 to give *24* trucks per hour.
3. Terminal—Trucks will circulate from the yard to Seventh to Bryant to Fremont to Terminal to Howard to Fourth to Townsend/Brannan to Seventh to yard. The volume will be *8* trucks/hr. This segment will be excavated at the same time as No. 2, giving a total of *24* trucks per hour.
4. Terminal down *Mission* Street—Trucks will circulate from the yard down Seventh to *Townsend to Embarcadero to Mission*, returning via *Embarcadero* to Townsend to

Seventh to yard. The volume will be 6 trucks per hour, giving a total of *7* trucks per hour when combined with No. 1.

Under this "worst case" analysis *for the cut-and-cover option, all of the trucks would travel along* Seventh Street, *departing or returning to the Caltrain Fourth and Townsend yard. B*ecause of the relatively low existing volumes on Seventh Street, *24 truck round trips per hour would not cause deterioration in the level of service on Seventh Street.* The *greatest impact under this* worst case *analysis* would be *24* trucks per hour being added to Howard Street at Third Street, but that is only one percent or less of the P.M. peak hour movement. The assumption of eight haul hours per day allows for avoidance of peak periods between 7 a.m. and 5 p.m., so the haul volumes can be scheduled outside the peak periods if necessary. *Impacts under the LPA would be lower than this worst case cut-and-cover scenario.* The next subsection analyzes the P.M. peak hour primary construction detour traffic with these haul movements superimposed.

#### 5.21.2.3 Detour for Second Street Closures

For the Cut-and-Cover Option, Second Street would be closed to through traffic one block at a time between Townsend Street and Howard Street to facilitate construction of the cut-and-cover trench. Each block would be closed for an estimated month or two except for maintaining essential local access. See Subsection 5.21.2.5 for a discussion of access to driveways.

During these rolling closures of the five blocks on Second Street between Townsend Street and Howard Street, through traffic would be detoured onto parallel streets, primarily Third and Fourth Streets. Third Street, currently one-way northbound, would be restriped to give three lanes northbound and two lanes southbound. On-street parking would be prohibited on Third Street for the duration of the detour. The bus lane on Third Street would become a mixed flow lane for the duration of the detour, although it also functions well as a combined bus/right-turn lane where there is a substantial number of right turns, such as at Harrison or Bryant Streets.

The Third Street detour can be accomplished in two phases. During any closure of Second Street south of Harrison Street, the two-way portion of Third Street would be from Harrison Street to King Street. In this phase, Third Street could remain one-way northbound north of Harrison Street. During any closure of Second Street north of Harrison Street, the two-way portion of Third Street will be from Howard Street to King Street. It is anticipated that the cut-and-cover trench on Second Street would be constructed from south to north, starting at Townsend Street and going to Howard Street.

During the closure of a block on Second Street, the two-way portion of Third Street would facilitate detouring traffic around the closed block. Because some of the cross streets are one way, through traffic would often be diverted for two blocks or more instead of around just one block. It is expected that much of the I-80 and I-280 traffic on Second Street would shift over to Fourth Street for the southbound portion of the detour and to Third Street for the northbound portion of the detour. *The LPA would use cut-and-cover construction only between Folsom and*

*Howard streets, and the two-way portion of Third Street would be limited to just the portion between Folsom and Howard streets to accommodate the southbound traffic in the closed block. Northbound traffic would have to be detoured two blocks on Third Street, from Harrison Street to Howard Street, but would use the existing northbound lanes on Third Street.*

### 5.21.2.4 Intersection Analysis

*Key intersections for detour traffic conflicts include Third/Howard, Third/Harrison, and Fourth/Harrison. Table 5.21-3 summarizes LOS calculations under detour and truck haul conditions for each closed block compared with baseline conditions in 2005, the expected midpoint of construction.*

**Table 5.21-3: Intersection Delay and LOS for Third Street Detour -- 2005 Conditions**

| | | Intersection* | | | |
|---|---|---|---|---|---|
| | | Third/Howard | | | |
| **Block Closed of Second Street** | | **Base** | **Mitigated** | **Third/Harrison** | **Fourth/Harrison** |
| None | LOS | B | | B | B |
| | Delay | 14.5 | | 10 | 11.4 |
| Howard/Folsom** | LOS | E | D | D | B |
| | Delay | 42.4 | 39.9 | 28.7 | 11.3 |
| Folsom/Harrison | LOS | E | D | D | B |
| | Delay | 42.4 | 39.9 | 30 | 11.3 |
| Harrison/Bryant | LOS | B | | D+ | B |
| | Delay | 14.5 | | 26.4 | 11.7 |
| Bryant/Brannan | LOS | B | | D+ | B |
| | Delay | 14.5 | | 26.4 | 11.7 |
| Brannan/Townsend | LOS | B | | D+ | B |
| | Delay | 14.5 | | 26.4 | 11.7 |

*Delay and level of service are based on 1994 Highway Capacity Manual (SIGNAL94). Delay is in seconds.
**NB lanes consist of two through lanes and one RT/bus lane

*The intersection affected with the most diverted turning movements, Third/Howard, dropped from LOS B to E with a lane configuration of two northbound mixed flow lanes and one bus lane. Elimination of the bus lane to give three northbound mixed flow lanes and the addition of a left turn lane on Howard resulted in the projected LOS reaching LOS D. None of the other key intersections affected by the detour were projected to have impacts from the detour.*

### *5.21.2.5 Other Detour Routes*

*Construction methods for the cut-and-cover tail track section of the Second-to-Mission Alternative would require that Mission Street be closed except for one lane in each direction with no parking for up to two years. As part of the construction phasing, Mission Street would have to be completely closed for an additional one to three months at both the start and finish of*

*construction to put on a temporary deck and to restore the street surface. Cross streets of Beale, Main, and Stuart would also require closure to through traffic at staggered periods of one to three months.*

*Similarly, construction methods for the cut-and-cover tail track section of the Second-to-Main Alternative would require that two lanes on Main Street be closed for up to two years. As part of the construction phasing, Main Street would have to be completely closed for an additional one to three months at both the start and finish of construction to put on a temporary deck and to restore the street surface. Cross streets of Folsom and Harrison would also require closure to through traffic at staggered periods of one to three months.*

*The detours in street traffic for either of these alternatives would result in adverse effects on intersection operations at several intersections in the downtown area. The detours would last two years and would add vehicular traffic to already congested movements and/or create new demand for movements that conflict with other high demand movements. Affected intersections for the Second-to-Mission Alternative would include:*

- *Beale/Howard*
- *Main/Howard*
- *Stuart/Howard*
- *Howard/Embarcadero*
- *Beale/Folsom*
- *Main/Folsom*
- *Folsom/Embarcadero*

*Affected intersections for the Second-to-Main Alternative would include:*

- *Embarcadero/Mission*
- *Embarcadero/Howard*
- *Embarcadero/Folsom*
- *Embarcadero/Harrison*

#### *5.21.2.6 Coordination with Third Street Light Rail/Central Subway*

*Potential exists for conflict between the traffic detour plans of the Central Subway project and the Caltrain extension alternatives. Both the Cut-and-Cover Option and the Tunnel Option would close portions of Second Street to through traffic while Third Street would be designated as a primary detour route. In contrast, the Central Subway project would close portions of Third Street to through traffic and would designate Second Street as a primary detour route. The schedules for the two projects, however, show that the Caltrain LPA would largely, if not entirely, avoid this conflict. Based on the current schedule for construction of the LPA, Second Street would be closed between Folsom Street and Howard Street for about two years, reopening in mid 2009. The proposed detour for this closure is discussed at the end of Subsection 5.21.2.3*

*above. The Central Subway project is currently scheduled to begin cur-and-cover station construction on Third Street between Folsom Street and Howard Street in mid 2009, avoiding the period when the LPA would use Third Street as a detour and when Second Street would not be available for the Central Subway detour. The Central Subway would have utility relocation activities that would precede the station construction, but the LPA schedule has potential to be accelerated to avoid conflict with those activities. The ISCOT Committee, an interdepartmental staff committee on Traffic and Transportation in the City and County of San Francisco, will be utilized to minimize or avoid the traffic detour conflicts between these two projects.*

### *5.21.2.7* Driveway Access

*The Second Street segment of the Second-to-Main and Second-to-Mission alternatives has the highest number of driveways that would be affected by cut-and-cover construction, and the following analysis represents a "worst-case" evaluation. The Tunneling Option for either Caltrain Downtown Extension alternative would have substantially fewer effects on driveways. Between Brannan and Howard Streets, there are 13 locations (i.e., parking lots, businesses, residents, etc.). In addition to these locations, four dead end streets cross Second Street at De Boom and Federal Streets, Dow Place, and Tehama Streets. These dead end streets provide access to numerous private parking lots, loading docks, and public parking. Easements would be required to maintain access at Tehama Street and Dow Place. Temporary alternative access would be acquired through private property between Federal and De Boom Streets. A list of driveways that would be affected by construction on Townsend, Second, Main, and Mission Streets is included in Table 5.21-4.*

**Table 5.21-4: Driveways and Streets Temporary Blocked By Construction**

| Street Segment | Address | Land Use | Description |
|---|---|---|---|
| **Townsend Street (Both Caltrain Extension Alternatives – (Cut-and-Cover or Tunnel Option)** | | | |
| **Fifth to Fourth Street** | 310 Townsend | Office | Garage Entrance/Exit |
| | 306 Townsend | Office | Garage Entrance/Exit |
| **Fourth to Third Street** | 292, 294, 296 Townsend | Retail | Parking entrance for numerous businesses. |
| | 290 Townsend | Retail | Loading Dock. |
| | On southern side of Townsend | Vacant/Under Construction | Driveways to new mixed use development. |
| **Third Street to Clarence Place (Cut-and-Cover Option only)** | 701 Third | Food | Townsend Street drive thru entrance and exit. |
| | 179 Third | Office | Garage and parking lot entrance and exit. |
| | 178 Third | Parking | Parking Garage Entrance. |
| **Second Street** | | | |
| **Brannan To Bryant (Cut-and-Cover Option only)** | Brannan @ Second (northwest side) | Vacant/Under Construction | Delivery Entrance. |
| | South Park @ Second (southwest side) | Vacant/Under Construction | Delivery/Driveway Entrance. |

**Table 5.21-4: Driveways and Streets Temporary Blocked By Construction**

| Street Segment | Address | Land Use | Description |
|---|---|---|---|
| | 577 Second | Retail | Driveway Entrance. |
| | 522 and 524 Second | Light Industrial | Driveway Entrance. |
| **Bryant To Harrison (Cut-and-Cover Option only)** | 461 Second | Residential | *Driveway* Entrance. |
| | Underneath I-80 Freeway | Parking | Parking Lot Entrance/Exit. |
| | 425 Second | Residential | Delivery Entrance/Exit. |
| | Not Available | Parking | Parking Lot Entrance/Exit. |
| | Second @ Harrison (southeast corner) | Parking | Parking Lot Entrance/Exit. |
| **Harrison To Folsom (Cut-and-cover Option only)** | On west side of Second | Parking | Parking Lot Entrance/Exit. |
| **Folsom To Howard (Cut-and-Cover or Tunneling Option)** | Folsom @ Second (northeast corner) | Hotel | Driveway of New Building. |
| | 246 Second | Residential | Driveway Entrance/Exit. |
| | Howard @ Second (southeast corner) | Parking | Parking Lot Entrance/Exit. |
| **Second-to-Main Alternative Only (Cut-and-Cover or Tunnel Option)** | | | |
| **Main Street** | | | |
| **Harrison To Folsom** | 365 Main | Vacant/Under Construction | Shipping/Receiving Driveways |
| | 390 Main | Public Services | Parking Lot Entrance/Exit. |
| | Folsom @ Main (southeast corner) | Parking | Parking Lot Entrance/Exit. |
| **Folsom To Howard** | | | |
| | 160 Folsom | Retail | Driveway Entrance on Main Street. |
| | On east side of Main | Parking | Parking Lot Entrance/Exit. |
| | 250 Main | Transportation | Three Parking Lot Entrances. |
| | 272 and 276 Main | Office | Parking Lot Entrance/Exit. |
| | 221 Main | Office | Underground Parking Lot Entrance/Exit. |
| **Second-to-Mission Alternative (Cut-and-Cover or Tunnel Option)** | | | |
| **Mission Street** | | | |
| **Main To Spear** | 77 Beale | Office | Driveway Exit. |
| | 110 Mission | Office | Parking Lot Entrance/Exit. |
| **At The Embarcadero** | On north side of Mission | Parking | Muni/Public Parking Entrance/Exit. |
| **Transbay Terminal Impacts** | 500 Mission | Office | Four Loading Docks on Minna Street. |

Loss of access to any property would be minimized via prompt construction of the roadway decks, first on one side and then the other. The construction contractor or construction representative would work with and notify property owners, businesses, and residents regarding the temporary loss of access.

Prior to initiating construction of each segment, outreach efforts would be performed to inform residents, businesses, and property owners of the proposed construction program. A community construction coordination program would be established to encourage communication between

the affected community, both residential and business, and the TJPA and JPB regarding construction impacts and possible mitigation and solutions.

Prior to and during construction, the TJPA and JPB staff would contact and interview individual businesses and property owners potentially affected by construction activities. Interviews with commercial establishments would provide knowledge and understanding of how these businesses carry out their work, and identify business usage, delivery and shipping patterns and critical times of the day and year for business activities. Data gathered from these interviews would assist the JPTA and JPB as they work with the DPT to develop the worksite traffic control plans. Among other elements, these plans will identify alternate access routes to maintain critical business activities.

The mitigation measures described in the following sections would be implemented by a combination of construction contract specifications, drawings, and provisions, as well as public affairs programs. TJPA and JPB staff would be assigned to work directly with the public to provide project information and to resolve construction-related problems. The TJPA and JPB will work with community residents, elected officials, local businesses, and community organizations to tailor the mitigation program to best meet community needs. Contractors will be monitored to assure that mitigation measures contained in the Final EIS/EIR are met.

The TJPA and JPB would inform the public of its progress in implementing the measures selected through a quarterly program of auditing, monitoring, and reporting. A quarterly status report would be made available to the public.

**Site and Field Offices**. During construction of the Terminal/Extension Project, TJPA and JPB staff would establish an information field office located along the alignment. The field office staff in conjunction with other staff would serve multiple purposes:

- Provide the community and businesses with a physical location where information pertaining to construction can be exchanged,
- Enable TJPA and JPB to better understand community/business needs during the construction period,
- Allow TJPA and JPB to participate in local events in an effort to promote public awareness of the project,
- Manage construction-related matters pertaining to the public,
- Notify property owners, residences, and businesses of major construction activities (e.g., utility relocation/disruption and milestones, re-routing of delivery trucks),
- Provide literature to the public and press,
- Promote and provide presentations on the project via a Speakers Bureau,
- Respond to phone inquires,
- Coordinate business outreach programs,
- Schedule promotional displays, and
- Participate in community committees.

The information office would be open various days of the work week for the duration of the construction period. A schedule will be developed before construction begins.

**Information Line**. A telephone information line would be available to provide community members and businesses the opportunity to express their views regarding construction. Calls received would be reviewed by TJPA and JPB staff and would, as appropriate, be forwarded to the necessary party for action (e.g., utility company, fire department, the Resident Engineer in charge of construction operations). Information available from the telephone line would include current project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints and general information. During construction of the project, phone service would be provided in English, Cantonese, and Spanish and would be operated on a 24-hour basis.

**Signage**. The TJPA and JPB would work with establishments affected by construction activities. Appropriate signage would be developed and displayed to direct both pedestrian and vehicular traffic to businesses via alternate routes.

**Traffic Management Plans**. Traffic management plans to maintain access to all businesses would be prepared for areas affected by surface or cut-and-cover construction. In addition, daily cleaning of work areas would be performed by contractors for the duration of the construction period. Provisions would be contained in construction contracts to require the maintenance of driveway access to businesses to the extent feasible.

**Deck Level**. Decking at the under-street cut-and-cover sections would be installed flush with the existing street or sidewalk levels.

**Sidewalk Design and Maintenance**. Wherever feasible, sidewalks would be maintained at the existing width during construction. Where a sidewalk must be temporarily narrowed during construction (e.g., deck installation), it would be restored to its original width during the majority of construction period. In some places this may require placing the temporary sidewalk actually on the deck. Each sidewalk design should be of good quality and approved by the Resident Engineer prior to construction. Handicapped access would be maintained during construction where feasible.

**Construction Site Fencing**. Construction site fencing should be of good quality, capable of supporting the accidental application of the weight of an adult without collapse or major deformation. Fence designs or examples would be submitted to the Resident Engineer for approval prior to installation. Where covered walkways or other solid surface fencing is installed, a program will be implemented to allow for art work (e.g., by local students) on the surface(s).

### 5.21.3 PARKING

On-street parking would be temporarily removed along specific streets for a set amount of time during construction. Under the Cut-and-Cover Option, parking on Second Street would be closed and re-opened on a block-by-block basis due to construction. To mitigate the closure of Second Street, traffic would need to detour to Third Street. When Second Street is closed south of Harrison, no parking would be allowed on Third between Harrison and King Streets. When Second Street is closed north of Harrison, no parking would be allowed on Third between Howard and King Streets. See Section 5.21.2.3 for details of the Second Street detour. The contractor would post dates and times of parking closures and openings. Loss of parking could affect local businesses, as discussed in Section 5.21.2.5. Table 5.21-5 includes segments where on-street parking would be temporarily removed during construction and the number of temporarily removed parking spaces removed is also shown.

The Caltrain ridership forecast did not assume parking capacity expansion at any stations that had reached parking capacity under the 2020 No-Project conditions. Therefore, there are no long-term adverse impacts to parking projected for Caltrain stations as a result of the Terminal/Extension Project.

**Table 5.21-5: On-Street Parking Removed During Construction**

| Second-to-Main and Second-to-Mission Alternatives | Direction of On-Street Parking | |
|---|---|---|
| **Townsend Street** | **Eastbound** | **Westbound** |
| Fifth to Fourth Street | Diagonal parking | Perpendicular parking |
| Fourth to Third Street | No parking (construction zone) | Parallel parking |
| Third Street to Clarence Place | Parallel parking | Parallel parking |
| **Second Street** | **Northbound** | **Southbound** |
| Brannan to Bryant | Parallel parking, 11 auto spaces | Parallel parking, 10 auto spaces |
| Bryant to Harrison | Parallel parking, 9 auto spaces | Parallel parking, 10 auto spaces |
| Harrison to Folsom | Parallel parking, 17 auto and 4 motorcycle spaces | Parallel parking, 15 auto spaces |
| Folsom to Howard | Parallel parking, 12 auto spaces | Parallel parking, 11 auto spaces |
| **Third Street** | **Northbound** | **Southbound** |
| King to Townsend | Parallel parking, 13 auto spaces | Parallel parking, 13 auto spaces |
| Townsend to Brannan | Parallel parking, 21 auto spaces | Parallel parking, 23 auto spaces |
| Brannan to Bryant | Parallel parking, 3 auto spaces | Parallel parking, 23 auto spaces |
| Bryant to Harrison | Parallel parking, 11 auto spaces | Parallel parking, 11 auto spaces |
| Harrison to Folsom | Parallel parking, 18 auto spaces | Parallel parking, 25 auto spaces |
| Folsom to Howard | No parking | No parking |
| **Second-to-Main Alternative** | **Northbound** | **Southbound** |
| Midway from Bryant to Howard | Parallel parking | Parallel parking |
| **Second-to-Mission Alternative** | **Eastbound** | **Westbound** |
| Main to Spear | Parallel parking | Parallel parking |
| Spear to Steuart | Parallel parking | Parallel parking |
| Steuart to The Embarcadero | Parallel parking | No parking |

### 5.21.4 PEDESTRIANS

Before construction of the Transbay Terminal/Extension Project begins, two one-story temporary terminals would be built. A terminal for AC Transit buses would be located on the block bounded by Beale/Howard/Main/Folsom Streets, and a terminal for Greyhound buses would be located on Folsom Street between Fremont and Beale Streets. Temporary bus terminals would be located contiguous to the P.M. casual carpool queuing area. Because the temporary terminals would disrupt this queue activity, the casual carpool queues would be moved to the west side of Beale Street.

The temporary AC Transit terminal would be located two blocks east and one block south of the existing terminal, while the Greyhound terminal would be located one block east and one block south of the existing Transbay Terminal. The existing (2000) pedestrian travel patterns to and from the Transbay Terminal as determined by the SFTA model indicate that 70 percent of pedestrians going to and from the terminal would have up to a four block longer walk than under the existing situation. An additional 22 percent would have to walk up to three additional blocks to reach the terminal, while 4 percent would have to walk about one additional block to reach the terminal. About four percent of pedestrian walk distances would not be affected or would be shorter. For those with up to a four block additional walk, this represents about 800 additional feet of travel distance. At a pedestrian pace of 200 feet per minute, the additional 4-block walk is estimated to take four minutes.

### 5.21.5 BICYCLES

The temporary relocation of the Transbay Terminal during construction would increase bike travel distance to the terminal for the majority of bicyclists. The distance would increase by up to four blocks, which would add about two additional minutes of bicycle travel time. No mitigation measures are proposed other than that bicycles would be allowed to use temporary street improvements made for transit.

### 5.21.6 NEIGHBORHOODS AND BUSINESSES

In general, business and residential impacts would include changes in traffic circulation attributable to street closures, some loss of on-street parking, increased truck as well as auto traffic on designated haul routes and detours, increased noise in the vicinity of surface construction, and views obstructed or worsened by construction activity.

The most substantial construction-phase effects on neighborhoods and businesses would occur on the four streets affected by the Cut-and-cover Option of both Caltrain Downtown Extension Alternatives. The disruption of residents and businesses during construction is an important

concern of the TJPA and JPB. Measures would be incorporated in the construction program to minimize impacts to residents and businesses.

**Impacts to Residential Areas.** Although most land uses along affected streets are commercial uses, there are some live/work lofts along Townsend Street and additional residential uses along Second Street, including live/work units at the Clock Tower Building, a residential building near Tehama Street, and the Courtyard Marriott hotel. During construction the residential uses would be subject to reduced vehicular access, increased traffic congestion, increased noise and construction-related dust.

**Impacts to Businesses.** Most of the land uses along the Caltrain Downtown Extension Alternative alignments are commercial, and the majority of these commercial establishments consist of office uses. There are also retail uses, particularly on the ground floors of buildings along each of the affected streets, and there are warehouse and light-industrial uses on Second and Townsend Streets. Cut-and-cover construction effects on businesses would include reduced vehicular access and increased traffic congestion, increased noise and debris, and decreased visibility of operating businesses. These disruptions would most likely have the greatest impact on the retail establishments, many of which rely more heavily on walk-in traffic and street visibility for sales activity than office uses and warehouse businesses also located in these areas. There is a potential reduction in the ability of large trucks to access warehouse and storage facilities.

The Muni Metro Turnback Project in downtown San Francisco serves as a meaningful case study from which to predict how businesses would be affected by project construction. During construction of the Muni Metro Project, businesses located along The Embarcadero – fronting the cut-and-cover construction of the project – experienced partial or complete loss of visibility and access. Where possible, these businesses reoriented themselves to Steuart Street. Several hotel and restaurant owners whose businesses were affected by severe noise and debris were successful in negotiating to cease all construction activity between 12:30 and 1:30 p.m. daily, in order to allow for more comfortable lunch hour operations. One small delicatessen, which lost all visibility due to construction fences that were assembled around the project, was offered reduced rent by the building owner for the duration of construction to offset sales losses.

The loss of on-street parking spaces also raises issues related to economic impacts. Several blocks of unmetered parallel parking spaces would be temporarily lost along Townsend Street during construction of the Townsend alignment, potentially exacerbating difficult conditions for local business owners, particularly the small retailers.

Prior to initiating construction on major elements of the Terminal/Extension Project, outreach efforts would be performed to inform residents, businesses, and property owners of the proposed construction program. A community construction coordination program as described above in Section 5.21.2.5 would be established to encourage communication between the affected community, both residential and business, and the TJPA and JPB regarding construction impacts and possible mitigation and solutions.

### 5.21.7 Community Facilities and Services

None of the community facilities identified in Section 4.3 would be affected by construction activities, except to the extent that traffic delays caused by temporary detours and congestion may inconvenience persons gaining access to these facilities.

Safety and security services during construction would be provided by the San Francisco Police Department and other security personnel identified in Sections 4.3 and 5.17. The San Francisco Police Department would likely assign officers to monitor traffic congestion and detours along surface streets during construction. It is likely that existing officers would be assigned to this task, and at this time no additional costs to the Department are anticipated. While emergency access would potentially be affected by any change in traffic conditions in the area, the traffic impacts of the project would be very minor and should not affect emergency response times.

The Fire Department would review project plans at time of permitting to ensure that adequate life safety measures and emergency access are provided during construction of the Terminal/Extension Project. To reduce the potential for impacts to occur a life safety plan would be developed and implemented, as described in Section 5.4.

The City's Solid Waste Management Program has indicated that the amount of construction debris generated and disposed of could be adequately accommodated by existing landfills (Kevin Drew, Solid Waste Management Program Associate, responses to questionnaire, June 13, 2001). Mitigation measures are identified in Section 5.21.6.2, however, in order to help San Francisco achieve the 50 percent reduction goal specified in the California Integrated Solid Waste Management Act of 1989 (AB 939). In addition, the Terminal/Extension Project would comply with all City and County ordinances regarding the minimization of waste though recycling.

To reduce the short-term solid waste impacts associated with construction, the construction specifications will require the use recycled construction materials where feasible, and will include specification regarding the recycling of construction and demolition materials.

### 5.21.8 Parklands, Schools, and Churches

None of the parks, schools, or churches identified in Section 4.4 would be affected by construction activities, except to the extent that traffic delays caused by temporary detours and congestion may inconvenience persons gaining access to these facilities.

### 5.21.9 Air Quality

Construction activities can cause pollutant emissions in a number of ways, including emissions of nitrogen oxides, carbon monoxide, and sulfur oxides from diesel-powered construction equipment; carbon monoxide emissions from worker vehicles; dust or $PM_{10}$ emissions from vehicles traveling on unpaved surfaces and/or grading and other earthmoving activities; and reactive organic gas emissions from asphalt placement and architectural coatings. There are no quantitative emissions thresholds for construction activities, which are by their nature temporary and occur over a large area, potentially affecting different receptors at different times. The Bay Area Air Quality Management District's (BAAQMD) approach to the analysis of construction impacts is to emphasize implementation of effective and comprehensive control measures rather than detailed quantification of emissions.

Specific construction practices can minimize or control certain emissions, and the following mitigation measures, which are derived from the "basic control measures" and the "enhanced control measures" recommended by the BAAQMD, are proposed as part of the project.

As part of the contract provisions, the project contractor would be required to implement the following measures at all project construction sites:

- Water all active construction areas at least twice daily. Ordinance 175-91, passed by the San Francisco Board of Supervisors on May 6, 1991, requires that non-potable water be used for dust control activities; therefore the project contractor would be required to obtain reclaimed water from the City's Clean Water Program or other appropriate sources.
- Cover all trucks hauling soil, sand, and other loose materials *or* require all trucks to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

- *Minimize use of on-site diesel construction equipment, particularly unnecessary idling.*
- *Shut off construction equipment to reduce idling when not in direct use.*
- *Where feasible, replace diesel equipment with electrically powered machinery.*
- *Locate diesel engines, motors, or equipment as far away as possible from existing residential areas.*
- *Properly tune and maintain all diesel power equipment.*
- *Suspend grading operations during first and second stage smog alerts, and during high winds, i.e., greater than 25 miles per hour.*

*Additionally, upon completion of the construction phase, buildings with visible signs of dirt and debris from the construction site shall be power washed and/or painted (given that permission is obtained from the property owner to gain access to and wash the property with no fee charged by the owner).*

### 5.21.10 CONSTRUCTION NOISE AND VIBRATION

#### 5.21.10.1 Impacts

Temporary intrusion from noise and vibration is associated with most large construction projects. Because of the short-term nature of the intrusion, construction noise and vibration are not usually considered impacts unless, as is the case for this project, the construction will last for an extended period of time.

Construction noise varies greatly depending on the construction process, type and condition of equipment used, and layout of the construction site. Many of these factors are traditionally left to the contractor's discretion, which makes it difficult to accurately estimate levels of construction noise. The noise impact assessment for a construction site is based on:

- An estimate of the type of equipment that will be used during each phase of the construction and the average daily duty cycle for each category of equipment,
- Typical noise emission levels for each category of equipment, and
- Estimates of noise attenuation as a function of distance from the construction site.

Although the lack of specific information at the time of the environmental assessment makes estimates of construction noise approximate, the projections do provide a good picture of where noise impacts are likely to occur and the general types of noise mitigation that will be required to mitigate the impacts.

Table 5.21-*6* summarizes some of the available data on noise emissions of construction equipment from the FTA Guidance Manual. Shown are the average of the $L_{max}$ values at a distance of 50 feet. Although the noise levels in the table represent typical values, there can be wide fluctuations in the noise emissions of similar equipment. In fact, several of the cited noise levels would exceed the limit in the San Francisco noise regulation that is discussed below.

**Table 5.21-6: Construction Equipment Noise Emission Levels**

| Equipment Type | Typical Sound Level at 50 ft (dBA) |
|---|---|
| Backhoe | 80 |
| Bulldozer | 85 |
| Compactor | 82 |
| Compressor | 81 |
| Concrete Mixer | 85 |
| Concrete Pump | 82 |
| Crane, Derrick | 88 |
| Crane, Mobile | 83 |
| Generator | 81 |
| Loader | 85 |
| Pavement Breaker | 88 |
| Paver | 89 |
| Pile Driver, Impact | 101 |
| Pump | 76 |
| Roller | 74 |
| Shovel | 82 |
| Truck | 88 |

Source: Harris Miller Miller and Hanson, September 2001

Construction noise at a given noise-sensitive location depends on the magnitude of noise during each construction phase, the duration of the noise, and the distance from the construction activities. Projecting construction noise requires a construction scenario of the equipment likely to be used and the average utilization factors or duty cycles (i.e., the percentage of time during operating hours that the equipment operates under full power during each phase). Using the typical sound emission characteristics, as given in Table 5.21-*6*, it is then possible to estimate $L_{eq}$ or $L_{dn}$ at various distances from the construction site.

Table 5.21-*7* is an example of the noise projections for equipment that is often used during cut-and-cover subway construction. For the calculations it is assumed that all the equipment is located at the geometric center of the construction work site. Based on this scenario, a 12-hour $L_{eq}$ of 88 dBA should be expected at a distance of 50 feet from the geometric center of the work site. This is equivalent to an $L_{eq}$ of approximately 76 dBA at a distance of 200 feet from the construction site, significantly higher than the normal daytime $L_{eq}$ in the project area even in locations where ambient noise exposure is relatively high because of traffic on I-80. On cut-and-cover construction, once roadway decking is in place over the excavated trench, most of the construction activities will be shielded by the decking material, resulting in substantially lower noise levels for buildings adjacent to the construction site.

| Table 5.21-7: Typical Equipment List, Subway Excavation | | | |
|---|---|---|---|
| **Equipment Item** | **Typical Sound Level at 50 ft (dBA)** | **Equipment Utilization Factor (%)** | **$L_{eq}$ (dBA)** |
| Air Compressor | 81 | 50% | 78 |
| Backhoe | 80 | 40% | 76 |
| Crane, Derrick | 88 | 10% | 78 |
| Dozer | 85 | 40% | 81 |
| Generator | 81 | 80% | 80 |
| Loader | 85 | 40% | 81 |
| Pavement Breaker | 88 | 4% | 74 |
| Shovel | 82 | 40% | 78 |
| Dump Truck | 88 | 16% | 80 |
| Total workday $L_{eq}$ at 50 feet (12-hour workday) | | | 89 |
| Source: Harris Miller Miller and Hanson, September 2001 | | | |

The construction phases of this project and the potential for noise and vibration impacts are summarized below:

**Utility Relocation:** Relocating the utilities that conflict with the construction would not have much potential for noise impact. The equipment used is typical of normal street work. This construction would not normally warrant nighttime construction except in areas where the relocation efforts would cause unacceptable interference with traffic.

**Demolition:** A number of buildings along the corridor would be demolished in preparation for cut-and-cover construction. No residential receptors are located near any of the buildings likely to be removed on Townsend Street. During the demolition of the Transbay Terminal, noise from impact equipment such as jackhammers, pavement breakers, and hoe rams could be disturbing to occupants of buildings near the Transbay Terminal. The land uses closest to the Transbay Terminal are primarily commercial and office space. Impacts on these spaces would be temporary and would not disrupt normal use of the buildings.

The other major demolition effort would be removing the existing bus ramps leading from the current western exit of the Transbay Terminal. Again, the impact equipment used in the demolition is the most likely to cause intrusive noise. The land uses closest to the ramps are primarily commercial and office space. Impacts on these spaces would be temporary, typically a month or two while the nearest ramp is being demolished, and would not disrupt normal use of the buildings.

**Surface Rail Line and Station Construction**: Surface rail line and station construction would primarily affect buildings along Townsend Street from Seventh Street to the subway portal. Existing land uses are primarily commercial, industrial or office space with some mixed-use residential buildings along Townsend Street west of Fourth Street. Noise from daytime construction, particularly pile driving, may be intrusive on an intermittent basis, however, compliance with the limits of the San Francisco noise regulations would avoid significant noise

impacts. Nighttime construction could result in noise impacts to mixed-use residential buildings within a block of Townsend Street.

**Retained Cut/Portal Construction:** The construction of the retained cut and the portal would include drilling a number of auger holes to build the soil-cement walls, excavation between the walls, and construction of the track bed and track. The land uses most affected by the construction would be along Townsend Street, which is primarily commercial and industrial with some office space. Some nighttime construction might be advantageous to avoid disruptions during normal business hours, but could result in noise impacts to mixed-use residential buildings within the blocks of Townsend Street to the west of Fourth Street.

**Tunnel Construction and Street Reconstruction:** This section addresses noise and vibration impacts of subway construction. The subway track sections between Townsend Street and the Transbay Terminal and on down Main Street or Mission Street would be constructed using cut-and-cover construction, or a combination of cut-and-cover and stacked-drift construction methods (to tunnel the portion of the alignment from Townsend Street to Folsom Street). It is anticipated that subway construction would last for a total period of approximately three and a half to four years, with up to 36 months required for the stacked-drift tunnel portion.

Cut-and-Cover Construction. The noisiest phases of cut-and-cover construction are the initial construction of the support walls and installation of the roadway decking. To minimize traffic disruption during installation of decking where the alignment passes under Beale Street, First Street and Fremont Street, some construction would be done during nighttime hours with trenches covered to allow normal traffic flow during the daytime. This nighttime construction would not cause noise impacts since there are no residential land uses in these areas. Once the decking is in place for cut-and-cover construction, excavation and construction would continue under the decking. During the excavation and bracing phases, above-ground activities would consist primarily of cranes removing excavated material and trucks hauling the excavated material away. Surface activities would not be a major factor for the remainder of cut-and-cover construction with the exception of street reconstruction at the very end of the project.

Vibration impacts from cut-and-cover construction methods would result primarily from the use of impact equipment such as hoe-rams. These impacts would be expected to produce some short-term annoyance exceeding frequent event criterion levels of 72 VdB throughout the duration of the cut-and-cover construction; mitigation measures are proposed. Impacts exceeding the damage criterion level are not anticipated.

Stacked-drift Tunneling. Construction machinery used for the stacked-drift tunneling method would include tracked vehicles, excavation equipment, and vibratory compactors. No noise impacts of stacked-drift tunneling are anticipated because land uses at the surface would be shielded from construction activities. The vibration produced by tunneling equipment would, however, be of sufficient magnitude to be perceptible and annoying at times for the occupants of residences closest to the construction. Exceedences of the frequent event criterion of 72VdB are

expected to be even greater than with cut-and-cover construction. Mitigation measures are identified.

**Vibration Effects on Historic Buildings.** Because vibration from construction activities and equipment can be of sufficient magnitude to damage fragile historic buildings, a special study was done to determine whether vibration impacts of the project would exceed criteria levels for such sensitive land uses. These criteria are listed in Table 5.21-*8*.

**Table 5.21-8: Construction Vibration Impact Criteria**

| Level of Impact | Land Use | Vibration Criterion, PPV (in.sec) |
|---|---|---|
| Threshold of Potential (Cosmetic) Damage | Fragile, Historic Structures | 0.5 |
| Threshold of Minor Structural Damage | Fragile, Historic Structures | 0.3 |
| Threshold of Potential (Cosmetic) Damage | Non-Fragile Structures | 0.2 |
| Threshold of Minor Structural Damage | Non-Fragile Structures | 0.12 |

Source: FTA

Based on the study, no damage from construction vibration is anticipated at any of the buildings in this area from typical construction methods. Comparing the highest anticipated construction vibration levels to these criteria confirms that anticipated construction activities would not be sufficient to cause structural damage, even to the most fragile historic structures.

**Controlled Detonation.** Controlled detonation may be required during tunnel construction through rock for both the cut-and-cover and stacked-drift construction methods, subject to additional geotechnical investigations and other considerations that would be determined during the final design and construction phases of the project. Any use of controlled detonation would be closely controlled and monitored to avoid damage to existing structures. Specific limits, practices, and monitoring and reporting procedures would be included within the contract documents to ensure that such construction methods, if used, would not exceed safety criteria.

**Contractor Work Areas:** The specific construction activities that would occur at these sites would vary, depending on their location, however, there would be a considerable amount of heavy equipment operations at the sites. These sites would be the proposed locations for removal of much of the excavated material from retained cut, cut-and-cover, and stacked-drift tunnel construction. Activities would include temporary muck storage, muck removal, trucks transporting material to the construction site, cranes lowering and lifting materials from the access shafts, heavy equipment such as front end loaders, ready-mix trucks delivering concrete to the job, and tunnel ventilation equipment. The six contractor staging/work areas being considered for cut-and-cover construction are:

1. East of Seventh Street, between Berry and Townsend Streets. This site is sufficiently removed from noise-sensitive receptors that the contractor would not have problems complying with the San Francisco noise regulations.

2. North of Townsend Street, between Clarence Place and Stanford Street. This would be the staging area for the demolition of buildings at the southern end of the cut-and-cover tunnel section. There are no noise-sensitive locations near this area.

3. Southwest corner of the intersection of Second and Brannan Streets. This site is located within 600 feet of multiple residences, however, several large buildings stand between the staging area and sensitive receptors. These buildings would provide adequate shielding between this staging area and nearby noise sensitive sites.

4. Northeast corner of the intersection at Howard Street and Second Street. This site is located within 500 feet of the apartment building at 246 Second Street and the Marriott Hotel along Second Street. Based on preliminary calculations, the Leq over an 8-hour shift would be approximately 69 dBA at the apartment building. An $L_{eq}$ of 57 dBA was measured at these residences for a one-hour period during the evening commute period. It is estimated that the 24-hour noise exposure is about 60 dBA.

   Depending on the layout of the construction site and the specific equipment used during nighttime hours, meeting the nighttime noise limit in the San Francisco noise regulations of ambient plus 5 dBA is likely to require 7 to 10 dBA of noise reduction. Because of the elevation of the high-rise apartments, a sound wall around the perimeter of the site would provide mitigation only for residents on the lower floors. It is expected that the contractor will work with the San Francisco Department of Public Works (DPW) to avoid noise impacts to the closest residences.

5. Parking lot on Main Street between Howard Street and Mission Street. There are no noise-sensitive land uses near this area.

6. The parking lot west of Main Street between Howard and Mission Streets. This site is sufficiently removed from noise-sensitive receptors that the contractor would not have problems complying with the San Francisco noise regulations.

**Haul Routes**: Deliveries to the construction sites and excavated material from the project will be moved along pre-selected haul routes. Most of the routes are along relatively busy streets with primarily commercial and industrial land uses. There are some intermixed office space and residential land uses along several of the planned haul routes. Because of the *relatively high volumes of existing traffic on the haul routes during the daytime, the addition of construction trucks would not increase total traffic volumes to the extent that they would increase overall noise to levels that would create noise impacts at sensitive receptors along the routes. At nighttime, when existing traffic volumes are lower than during the day, the addition of construction trucks could influence traffic volumes to the extent that noise impacts would occur*

in the following areas: Fourth Street, one block on Howard Street, and Brannan Street near Fourth Street.

### 5.21.10.2 Mitigation Measures

**Noise**: The following mitigation measures are proposed to reduce construction noise impacts:

1. Comply with the San Francisco Noise Ordinance. The noise ordinance includes specific limits on noise from construction. The basic requirements are:

   - Maximum noise level from any piece of powered construction equipment is limited to 80 dBA at 100 ft. This translates to 86 dBA at 50 feet.
   - Impact tools are exempted, although such equipment must be equipped with effective mufflers and shields. The noise control equipment on impact tools must be as recommended by the manufacturer and approved by the Director of Public Works.
   - Construction activity is prohibited between 8 p.m. and 7 a.m. if it causes noise that exceeds the ambient noise plus 5 dBA.

   The noise ordinance is enforced by the San Francisco DPW, which may waive some of the noise requirements to expedite the project or minimize traffic impacts. For example, along Townsend Street where much of the land use is commercial, business owners may prefer nighttime construction since it would reduce disruption during normal business hours. The DPW waivers usually allow most construction processes to continue until 2 a.m., although construction processes that involve impacts are rarely allowed to extend beyond 10 p.m. This category would include equipment used in demolition such as jackhammers and hoe rams, and pile driving.

   It is not anticipated that the construction documents would have specific limits on nighttime construction. There may be times when nighttime construction is desirable (e.g., in commercial districts where nighttime construction would be less disruptive to businesses in the area) or necessary to avoid unacceptable traffic disruptions. Since the construction would be subject to the requirements of the San Francisco noise regulations, in these cases, the contractor would need to work with the DPW to come up with an acceptable approach balancing interruption of the business and residential community, traffic disruptions, and reducing the total duration of the construction.

2. Conduct Noise Monitoring. The purpose of monitoring is to ensure that contractors take all reasonable steps to minimize noise.

3. Conduct Inspections and Noise Testing of Equipment. This measure will ensure that all equipment on the site is in good condition and effectively muffled

4. Implement an Active Community Liaison Program. This program would keep residents informed about construction plans so they can plan around periods of particularly high

noise levels and would provide a conduit for residents to express any concerns or complaints about noise.

5. Minimize the Use of Vehicle Backup Alarms. A particular concern is for backup alarms on construction vehicles operating during nighttime hours. Because backup alarms are designed to get people's attention, the sound can be very noticeable even when their sound level does not exceed the ambient, and it is common for backup alarms at construction sites to be major sources of noise complaints. A common approach to minimizing the use of backup alarms is to design the construction site with a circular flow pattern that minimizes backing up of trucks and other heavy equipment. Another approach to reducing the intrusion of backup alarms is to require all equipment on the site to be equipped with ambient sensitive alarms. With this type of alarm, the alarm sound is automatically adjusted based on the ambient noise. In nighttime hours when ambient noise is low, the backup alarm is adjusted down.

6. Include Noise Control Requirements in Construction Specifications. These should require the contractor to:
   - Perform all construction in a manner to minimize noise. The contractor should be required to select construction processes and techniques that create the lowest noise levels. Examples are using predrilled piles instead of impact pile driving, mixing concrete offsite instead of onsite, and using hydraulic tools instead of pneumatic impact tools.
   - Use equipment with effective mufflers. Diesel motors are often the major noise source on construction sites. Contractors should be required to employ equipment fitted with the most effective commercially available mufflers.
   - Perform construction in a manner to maintain noise levels at noise sensitive land uses below specific limits.
   - Perform noise monitoring to demonstrate compliance with the noise limits. Independent noise monitoring should be performed to check compliance in particularly sensitive areas.
   - Minimize construction activities during evening, nighttime, weekend and holiday periods. Permits would be required before construction can be performed in noise sensitive areas during these periods.
   - Select haul routes that minimize intrusion to residential areas. This is particularly important for the trench alternatives that will require hauling large quantities of excavation material to disposal sites.

7. Controlling noise in contractor work areas during nighttime hours is likely to require some mixture of the following approaches:
   - Restrictions on noise producing activities during nighttime hours.

- Laying out the site to keep noise producing activities as far as possible from residences, to minimize the use of backup alarms, and to minimize truck activity and truck queuing near the residential areas.
- Use of procedures and equipment that produce lower noise levels than normal. For example, some manufacturers of construction equipment can supply special noise control kits with highly effective mufflers and other materials that substantially reduce noise emissions of equipment such as generators, tunnel ventilation equipment, and heavy diesel power equipment including mobile cranes and front-end loaders.
- Use of temporary barriers near noisy activities. By locating the barriers close enough to the noise source, it is possible to obtain substantial noise attenuation with barriers 10 to 12 feet high even though the residences are 30 to 40 feet higher than the construction site.
- Use of partial enclosures around noisy activities. It is sometimes necessary to construct shed-like structures or complete buildings to contain the noise from nighttime activities.

**Vibration:** The following procedures will be used to minimize the potential for annoyance or damage from construction vibration:

1. Limit or prohibit use of construction techniques that create high vibration levels. At a minimum, processes such as pile driving would be prohibited at distances less than 250 feet from residences.

2. Restrict procedures that contractors can use in vibration sensitive areas. It is often possible to employ alternative techniques that create lower vibration levels. For example, unrestricted pile driving is one activity that has considerable potential for causing annoying vibration. Using the cast-in-drilled-hole piling method instead will eliminate most potential for vibration impact from the piling.

3. Require vibration monitoring during vibration intensive activities.

4. Restrict the hours of vibration intensive activities such as pile driving to weekdays during daytime hours.

5. If resident annoyance from vibration becomes a problem, alternative construction methods and practices would be investigated in coordination with the construction contractor to reduce the impacts.

6. Include specific limits, practices and monitoring and reporting procedures for the use of controlled detonation, if this construction technique is determined to be necessary.

### 5.21.11 WATER RESOURCES

Construction grading, tunneling, and utility excavations would increase the sediment load to storm sewers during rainfall events. Sediment sources created during construction include soil stockpiles; soil tracked across construction areas, staging areas, and public roads; and soil transported to these areas by wind. Because stormwater in the study area discharges to the City's combined storm/sanitary sewer system, sediment transported by stormwater would not affect surface water bodies in the project area (China Basin and San Francisco Bay). However, wind-transported soils could contain contaminants that would affect nearby surface waters.

Construction dewatering would locally result in the temporary lowering of the water table and could promote the downward migration of contaminants from the uppermost groundwater zone to deeper groundwater zones. If dewatering lowers the water table in areas where free-phase petroleum hydrocarbons are floating on the water table, the resulting decrease in the water-table elevation would smear the hydrocarbons across soils that otherwise may be only minimally affected. The impacts associated with handling and disposal of contaminated dewatering effluent are further discussed in Section 5.21.14.

Construction excavation spoils will be appropriately managed so as to minimize wind dispersion of potentially contaminated soil particles. Spoils management practices are to include covering stockpiles with plastic sheeting, periodically spraying water on exposed soil areas to suppress dust generation, and decontamination of vehicles prior to departure from construction and staging areas.

As discussed in Section 5.21.15, construction dewatering would be performed in stages in order to minimize downward migration of contaminants in shallow groundwater. Dewatering effluent will be discharged to the sanitary sewer and, therefore, would not affect nearby surface waters.

Chemical test results for groundwater samples along the alignment would be used to obtain a batch discharge permit from the San Francisco Department of Public Works and to evaluate requirements for treatment prior to discharge to the sanitary sewer. Effluent produced during the dewatering of excavations would be collected in onsite storage tanks and periodically screened for potential contamination to confirm the need for treatment prior to discharge. If necessary, treatment may include:

I. Allowing sediment to settle out of the effluent in order to reduce elevated metals concentrations that can result from high quantities of suspended sediment; and/or

II. Carbon filtering to remove fuel hydrocarbons and PAHs.

### 5.21.12 UTILITIES

Impacts to utilities for the overall project are discussed in Section 5.12. If necessary, disruptions to service during construction would be short-term and carefully scheduled with advance notice given to affected customers.

### 5.21.13 ELECTROMAGNETIC FIELDS

There would be no electromagnetic field impacts associated with construction of the Terminal/Extension Project.

### 5.21.14 HISTORICAL AND CULTURAL RESOURCES

#### 5.21.14.1 Archaeological Resources

Long-term impacts to archaeological resources that may exist within the project Area of Effects (APE) – including measures to be taken in the event of unanticipated discoveries during construction – are discussed in Section 5.14, Historic and Cultural Resources.

If buried cultural materials are unearthed during construction, work in the vicinity of the find would be halted until a qualified archaeologist can assess their significance. If human remains are encountered during construction, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code 5097.88. In either instance, TJPA, JPB, the City and County of San Francisco, and the Redevelopment Agency would be immediately notified. *Please see Section 5.14.2 for a more detailed discussion of archaeology mitigation measures.*

#### 5.21.14.2 Historical Architectural Resources

Project impacts on historical architectural resources within the project APE are described in Section 5.14, Historic and Cultural Resources. Section 5.14 also describes suggested mitigation measures for long-term impacts to these resources; actual mitigation measures will be determined in consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation and reported in the Final EIS/EIR.

A construction easement will be required into the southeast corner of the 166-178 Townsend Street property, which is a contributor to the significance of the Rincon Point / South Beach Historic Warehouse – Industrial District. To avoid impacts to the building during and following construction of the subway, it is proposed to underpin the building prior to initiation of construction activities.

### 5.21.15 CONSTRUCTION HAZARDOUS MATERIALS IMPACTS

Two main types of hazardous materials/wastes may cause construction impacts: those used in the construction process and those that would be encountered or generated during construction.

Some hazardous materials, primarily fuels and motor oils, would be used during construction. Construction of aboveground facilities would also use paints and other cleaners or degreasers. While these are commonly used materials, they are considered hazardous materials (fuels, for example, are flammable) based on their physical properties, and improper handling could potentially endanger workers and the public and also could result in contamination of soil and/or water.

Contact with contaminants in the study area could potentially have adverse effects on worker, public, and environmental health and safety. During project construction, workers could be exposed to soil and/or groundwater containing hazardous substances via direct contact (ingestion or dermal contact) with contaminated soil and groundwater or via airborne pathways (inhalation of vapors). The public and environment could be exposed to contaminants transported offsite during construction. The degree of hazard associated with these impacts on human or environmental receptors would be a function of the chemical properties, concentrations and volume of contaminants, nature and duration of construction activities, and contaminant migration pathways. However, the largest degree of potential exposure risk is with the construction worker.

Construction activities such as excavation, installation of deep foundations, or site dewatering within existing contaminated areas could potentially increase the spread of contaminants to surface water and other groundwater zones along the proposed alignment. Disposal of contaminated soil would transport contaminants out of the study area as well.

As noted in Section 4.17, a total of 37 regulatory agency lists were searched to identify listed facilities within the project area. For purposes of this analysis, the 41 identified hazardous materials sites in the study area have been classified into three categories:

- Locations that would be directly affected by construction along the proposed extension alignments;
- Locations adjacent to or near the proposed project alignments that could be affected by project construction or that could provide sources of contaminants to the construction areas; and,
- Properties with essentially no anticipated adverse impacts due to the distance from the proposed construction areas and nature of contamination.

Table 5.21-*9* presents a breakdown of the identified sites into these categories.

**Storage Yard Area.** Most of the identified hazardous materials sites located near the proposed storage yard are included on agency lists due to releases from underground storage tanks (USTs). According to the agencies' information, the types of petroleum hydrocarbons that have been released from USTs near the proposed storage yards and surface tracks include diesel fuel, gasoline, motor oil, and various fuel oils.

Construction of the storage yard and trenching for the alignment would result in disturbance of surface soils. None of the excavations are expected to be deep enough to encounter groundwater. Therefore, impacts to construction of the storage yard from UST releases would be limited to spoils handling and worker health and safety precautions for hydrocarbon-contaminated soil.

Because of their close proximity to the planned alignment, the following sites have the greatest likelihood to affect storage yard and track construction:

- Southern Pacific Transportation, 329 Townsend Street, Site 30
- Flair Electro Sales, 516 Townsend Street, Site 34

Properties that are listed by the agencies to have remediation completed or deemed unnecessary are listed under the non-hazardous category. In addition to UST-related hydrocarbons, other potentially hazardous constituents that may affect yard and surface track construction include metals (primarily lead), PAHs, and VOCs (mainly solvents). PAHs and elevated concentrations of lead were detected during Embarcadero roadway-related investigations and construction along King Street (Site 32). Additionally, lead contamination is prevalent in fill material in the South of Market area (SOMA) and is likely to be encountered in fill disturbed by yard and track construction. Although coal tar has not been specifically identified in the storage yard and surface track area, PAHs associated with coal tar residues and other past land uses may be encountered in the fill.

**Townsend Street Cut-and-Cover Area.** Two identified sites, Sun Chemical Corporation No. 1 (Site 24) and the San Francisco Iron Foundry (Site 26), lie in or adjacent to the Townsend Street cut-and-cover subway segment. The Sun Chemical Corporation site is listed as requiring no further action by the California Department of Toxic Substances Control (DTSC). No information was available in the agencies' databases regarding the nature of contamination at the San Francisco Iron Foundry site. However, based on the type of industry implied by the site name, it is reasonable to expect that soils at that site may contain elevated metals concentrations.

**Table 5.21-9: Classification of Potential Hazards Associated with Hazardous Materials Sites**

| Site No[1] | Site Name and Location | Potential Construction-Related Hazard | | |
|---|---|---|---|---|
| | | None [2] | Indirect [3] | Direct [4] |
| 1 | Federal Reserve Bank, SE Corner of Mission and Main Streets | | X | |
| 2 | Talco Inc., 621 First Street | | X | |
| 3 | San Francisco Gas & Light Co., 401 Howard Street | | X[5] | |
| 4 | Caltrans (Transbay Terminal), 150 First Street | | | X |
| 5 | San Francisco Gas Light Co., 166 Fremont Street, 498 Howard Street | | | X |
| 6 | U.S. Marine Corps – Supply Depot, 160 Harrison Street | | X | |
| 7 | 524 Howard Street HOA | X | | |
| 8 | Transportation the Department, 434 Main St | X | | |
| 9 | Caltrans, 120 Richards Street | | X | |
| 10 | Dahl Beck Electric Co., 580 Howard Street | | X | |
| 11 | 141 New Montgomery, 171 New Montgomery Street | X | | |
| 12 | Oriental Warehouse | | X | |
| 13 | Unspecified Site, Second and Townsend Streets | X | | |
| 14 | Pacific Bell, 611 Folsom Street | | | X |
| 15 | 600 Harrison Street | | X | |
| 16 | Photosynthesis LTD Chromeworks, 425 Bryant Street | X | | |
| 17 | George Lithograph CO, 650 Second Street | | X | |
| 18 | San Francisco Fire Dept., 698 Second Street | | X | |
| 19 | Commercial Building, 35 Stanford Street | X | | |
| 20 | Commercial Building, 101 Townsend Street | X | | |
| 21 | San Francisco Gas & Electric Co., 120 King Street | | X | |
| 22 | Pacific Gas Improvement Co., 169 Townsend Street | | X | |
| 23 | McDonalds Corp., 701 Third Street | | X | |
| 24 | Sun Chemical Corporation No. 1, 252 Townsend Street | | | X |
| 25 | Unspecified (Embarcadero Roadway Project) | | X | |
| 26 | San Francisco Iron Foundry, 260 Townsend Street | | | X |
| 27 | Heublin, Inc., 601 Fourth Street | | X | |
| 28 | San Pacific Imports, 530 Brannan Street | | X | |
| 29 | Commercial Building, 542 Brannan Street | | X | |
| 30 | Southern Pacific Transportation, 329 Townsend Street | | | X |
| 31 | SF Newspaper Agency, 590 Brannan Street | | X | |
| 32 | Unspecified (Embarcadero Roadway Project) | | X | |
| 33 | California Poultry Company, 777 Brannan Street | | X | |
| 34 | Flair Electro Sales, 516 Townsend Street, | | X | |
| 35 | Independent Electric Supply, 550 Townsend Street | | | X |
| 36 | Baker/ Hamilton Building, 638 King Street | | X | |
| 37 | Baker/ Hamilton Properties, LLC, 650 King Street | | X | |
| 38 | Golden Gate Disposal Co., 900 7th Street | | X | |
| 39 | Former Southern Pacific Co., 415 Channel Street | | X | |
| 40 | Greyhound, Hooper/ Seventh Street | | X | |
| 41 | The Glidden Company, 1400 Seventh Street | | X | |

Notes:
[1] Site numbers correspond to site location numbers shown on Figure 4.17-1.
[2] Sources of potential contamination are judged to be sufficiently far from proposed construction activities that environmental impacts are not anticipated
[3] Properties adjacent to proposed construction areas or properties where the presence of potential sources is not well defined relative to planned construction
[4] Properties where proposed construction may pass directly through areas of known contamination.
[5] Contamination may extend beyond site boundaries into areas that would be directly affected by construction.

Source: Dames & Moore, 1996

No other identified hazardous materials sites located near the Townsend Street cut-and-cover tunnel section are expected to have affected soil that would be disturbed during construction of the Townsend Street segment.

Several identified UST release locations (Sites 16, 27, 28, 29, and 31) may be located hydrogeologically upgradient of the cut-and-cover tunnel section; therefore, groundwater affected by fuel hydrocarbons may be encountered during construction dewatering.

The most substantial UST release site near the proposed Fourth and Townsend Street subsurface station is SF Newspaper Agency (Site 31), which reportedly has gasoline product floating on the water table. Depending on the lateral extent of the floating product, dissolved-phase gasoline constituents, and groundwater flow direction, gasoline hydrocarbons from this site could affect construction dewatering and worker health and safety.

**Townsend Street.** The subway portion of Townsend Street potentially intersects an additional three identified hazardous materials sites (Sites 30 and 34). Potential impacts associated with Sites 30 and 34 are similar to those discussed above for the storage yard and surface tracks, with the following exceptions:

- Soil disposal costs may be increased due to the large quantity of soils that would be excavated during cut-and-cover construction; and
- The subway excavation would require dewatering of groundwater potentially contaminated by fuel hydrocarbon constituents.

Construction of the cut-and-cover subway would require disturbance of fill that potentially contains lead and PAHs in addition to fuel hydrocarbons, as is the case with other components of the surface track, storage yard, and Townsend Street alignments.

The Tunnel Option would extend through bedrock and would be below the current groundwater table throughout the entire alignment. Because fuel hydrocarbons associated with UST sites have a tendency to float on the groundwater table, it is unlikely that hydrocarbon-affected bedrock would be encountered. Therefore, impacts from potential UST release sites would be limited to contaminated groundwater or floating product that could enter the tunnel excavation or require special disposal when intercepted by the tunnel dewatering system. Entry of dissolved-phase or free-phase fuel hydrocarbons into the tunnel could create explosion or inhalation hazards. If present in the dewatering system effluent, fuel hydrocarbons may prevent direct discharge of the effluent to the sanitary sewer without appropriate treatment.

Identified UST release sites near the tunnel section (Sites 15, 17, 18, 20, and 27), are either unconfirmed releases or listed as requiring no further remedial action. Sites 12, 13, 14, 16, 19, and 21 do not have a current status listed in the agency reports. Floating product was reportedly present at an unspecified commercial building at 101 Townsend Street (Site 20), however the agency reports a current status of "remediation completed or deemed unnecessary."

Metals and PAHs have been detected at sites in the Townsend Street vicinity (Sites 12, 13, and 25). These contaminants are encountered in fill material and, to a limited extent, may extend down into underlying native soils but are not expected to be present in bedrock. In addition, low concentrations of metals and PAHs may be present in groundwater intercepted by the tunnel dewatering system. Contamination in soil would not likely affect this section of the tunnel. Soils overlying bedrock may contain metals, PAHs, and/or fuel hydrocarbons at sufficient concentrations to require worker health and safety precautions and special handling and disposal of excavated soil.

**Folsom to Transbay Terminal Segment**

Three of the identified hazardous materials sites are located near the cut-and-cover subway segment north of Folsom Street to the proposed underground terminal. The first site, Pacific Bell (Site 14), is shown as the site of a release of diesel into surrounding soil. It is also listed as a small quantity generator of hazardous wastes. The second site is located at 171 New Montgomery Street (Site 11) and is listed with a status of "remediation completed or deemed unnecessary." Dahl Beck Electric Company (Site 10) is reported as having a gasoline release to soil with a status of "remediation completed or deemed unnecessary."

This cut-and-cover section is located outside of known areas of coal tar residues, but may still have been affected by low concentrations of PAHs. Similarly, this subway section is not included within the Article 22A[50] zone but may encounter fill soils that contain elevated concentrations of lead or other metals.

**Transbay Terminal.** UST release sites located near this cut-and cover section include sites 1, 2, 4, 6, 7, and 8. All of these sites are listed as either unconfirmed, "case closed," or "remediation completed or deemed unnecessary." There are known coal tar deposits in this area from the former San Francisco Gas Light Co. (Sites 3 and 5). The identified UST release sites include the Federal Reserve Bank (Site 1), Talco Inc. (Site 2), the Caltrans-Transbay Terminal site (Site 4), the former U.S. Marine Corps Supply Depot (Site 6), 524 Howard Street HOA (Site 7), and the Transportation Department (Site 8). Details regarding the nature of contamination at these sites are discussed below, with contamination from UST releases for all three sites discussed first, followed by specifics related to the presence of asbestos at the Transbay Terminal itself.

Construction of the new Caltrain underground terminal would require excavating potentially contaminated soils and dewatering of groundwater that may include hazardous contaminants. A portion of the underground terminal is located within the Article 22A zone, indicating that soils encountered during construction are likely to have elevated concentrations of lead and other metals and possibly PAHs. In addition, coal tar deposits are likely to be encountered in the eastern half of the terminal excavation while surrounding soils are expected to contain PAHs associated with coal tar residues. The underground terminal would be located adjacent to a former coal gas plant, the San Francisco Gas Light Company (Sites 3 and 5). Elevated levels of

[50] Article 22A of the San Francisco Public Health Code (Maher Ordinance).

PAHs in soil have been detected at several nearby sites, including the Oriental Warehouse (Site 12) and an unspecified site at Second and Townsend Streets (Site 13), as well as several other sites along Howard Street between Fremont and Main Streets. In addition to soil contamination, groundwater contamination associated with the coal tar residues has also been detected in these areas and may potentially affect dewatering operations.

In addition, there is one UST site near the proposed underground terminal that has the potential to affect construction of the station. The Federal Reserve Bank (Site 1) is located approximately 400 feet from the proposed underground terminal and is reported to have had an unconfirmed release of gasoline that affected groundwater.

Based on the presence of UST releases at and near the proposed terminal, and on the probability that other unreported UST releases have occurred in the area, it is likely that some soils encountered during construction would have detectable concentrations of fuel hydrocarbons. Depending on the lateral extent of dissolved-phase constituents and groundwater flow direction during dewatering, gasoline hydrocarbons from past UST releases and groundwater contamination associated with coal tar residues could affect construction dewatering and worker health and safety. If present in the dewatering system effluent, fuel hydrocarbons may prevent direct discharge of the effluent to the sanitary sewer without appropriate treatment.

**Asbestos-Containing Building Materials at the Transbay Terminal Building.** Caltrans performed an asbestos survey of the Transbay Terminal in 1986 that identified asbestos-containing building materials (ACM) including domestic water and heating pipe insulation, mechanical equipment insulation, and floor tiles. As part of its 1993 renovation of the terminal building, Caltrans removed asbestos-containing thermal systems insulation, vinyl floor tile and mastic, and transite ducting from various areas of the terminal. Also in 1993, the reinforced concrete roof of the terminal was replaced with a lightweight metal roof. This replacement included the removal of approximately 100,000 square feet of built-up asphalt and gravel roofing, vent pipes, and cold joint fillers, all of which were reported to contain asbestos.

Based on this information, some or all of the identified ACM has been removed from the Transbay Terminal. The presence of additional ACM cannot be ruled out without additional survey. Demolition of the terminal without prior abatement of ACM could result in exposure of construction workers and the general public to asbestos fibers.

**Mitigation Measures.** Handling and storage of fuels and other flammable materials during construction would follow California OSHA and local standards for fire protection and prevention. These measures include appropriate storage of flammable liquids and prohibition of open flames within 50 feet of flammable storage areas.

Prior to construction, the potential presence of contaminants in soil and groundwater would be investigated using conventional drilling, sampling, and chemical testing methods. Based on the chemical test results, a mitigation plan would be developed to establish guidelines for the disposal of contaminated soil and discharge of contaminated dewatering effluent, and to generate

data to address potential human health and safety issues that may arise as a result of contact with contaminated soil or groundwater during construction. The investigation and mitigation plan would follow the requirements of Article 22A in the appropriate areas along the alignment.

With construction projects of this nature and magnitude, there are typically two different management strategies that can be employed to address contaminated soil handling and disposal issues. Contaminated soil can be excavated and stockpiled at a centralized location and subsequently sampled and analyzed for disposal profiling purposes in accordance with the requirements of the candidate disposal landfill. Alternatively, soil profiling for disposal purposes can be done in-situ so when soil is excavated it is loaded directly on to trucks and hauled to the appropriate landfill facility for disposal based on the in-situ profiling results. A project of this nature could also combine both strategies.

Soils removed during excavation and grading activities that remain at a centralized location for an extended period of time would be covered with plastic sheeting to prevent the generation of fugitive dust emissions that migrate offsite. Additionally, dust control measures would be implemented during construction grading and excavation as necessary to minimize offsite migration of contaminants. Soil for disposal at a landfill or recycling facility would be transported by a licensed waste hauler, under appropriate manifests or bill of lading procedures, as required.

Chemical test results for groundwater samples along the alignment would be used to obtain a Batch Discharge Permit under Article 4.1 of the San Francisco Department of Public Works as well as to evaluate requirements for pretreatment prior to discharge to the sanitary sewer. Effluent produced during the dewatering of excavations would be collected in onsite storage tanks and periodically tested, as required under discharge permit requirements, for potential contamination to confirm the need for any treatment prior to discharge. If required, treatment may include:

- Settling to allow particulate matter (total suspended solids) to settle out of the effluent in order to reduce the sediment load as well as reduce elevated metal and other contaminant concentrations that may be associated with suspended sediments; and/or
- Construction of a small-scale batch waste water treatment system to remove dissolved contaminants (mainly organic constituents such as petroleum hydrocarbons (gas, diesel, and oils), BTEX, and VOCs) from the dewatering effluent prior to discharge to the sanitary sewer. A treatment system would also likely employ the use of filtration to remove suspended solids.

A detailed mitigation plan for the handling of potentially contaminated soil and groundwater will be developed prior to starting project construction.

Dewatering systems would be designed to minimize downward migration of contaminants that can result from lowering the water table if necessary based on environmental conditions. As necessary, shallow soils with detected contamination would be dewatered first using wells

screened only in those soils. Dewatering of deeper soils would then be performed using wells screened only in the zone to be dewatered. Dewatering wells would be installed using drilling methods that prohibit shallow contaminated soils from being carried deeper into the boreholes.

Workers performing activities on site that may involve contact with contaminated soil or groundwater would be required to have appropriate health and safety training in accordance with 29 CFR 1910.120. A Worker Health and Safety Plan (HSP) would be developed for the project and monitored for the implementation of the plan on a day-to-day basis by a Certified Industrial Hygienist (CIH). The HSP would include provisions for:

- Conducting preliminary site investigations and analysis of potential job hazards;
- Personnel protective equipment;
- Safe work practices;
- Site control;
- Exposure monitoring;
- Decontamination procedures; and
- Emergency response actions.

The HSP would specify mitigation of potential worker and public exposure to airborne contaminant migration by incorporating dust suppression techniques in construction procedures. The plan would also specify mitigation of worker and environmental exposure to contaminant migration via surface water runoff pathways by implementation of comprehensive measures to control drainage from excavations and saturated materials excavated during construction.

Mitigation measures for ACM would include identification of all available asbestos survey and abatement reports and supplemental asbestos surveys, as warranted. Identified ACM would require abatement prior to building demolition. Removal and disposal of ACM would be performed in accordance with applicable local, state, and federal regulations. In addition to ACM, lead-based paint may also require abatement prior to building demolition. A lead-based paint survey would be required to determine areas where lead-based paint is present and the possible need for abatement prior to demolition.

### 5.21.16 AESTHETICS & VISUAL IMPACTS

As described in Section 5.20, project construction for all three components would be multi-phased and would occur in different locations at different times. Wherever and whenever construction occurs, construction equipment and supplies would be visible, and evidence of construction activity would be noticeable to area residents, employees, and visitors. Short-term visual changes as a result of construction activities are a common and accepted feature of the urban environment, and generally mitigation is not required. Nonetheless, the TJPA and JPB would require the project contractors to ensure that construction crews working at night direct any artificial lighting onto the work site in order to minimize "spill over" light or glare effects on

adjacent areas. The TJPA and JPB, through its on-site field office, would make all efforts possible to minimize specific aesthetic and visual effects of construction identified by neighborhood businesses and residents.

### 5.21.17 GEOLOGIC IMPACTS ON PROJECT CONSTRUCTION

The primary geologic units that could adversely affect construction activities of the Terminal/Extension Project include artificial fill and bedrock. Impacts associated with these units are discussed in the following sections.

**Fill**. Fill soils possess adverse characteristics such as rubble, heterogeneity of composition and depth, and locally high permeability. Because of localized areas of high permeability, fill soils may be difficult to dewater during construction of tunnels and building foundations. Dewatering requirements affect the cost of constructing tunnels and the underground station by increasing the cost to (1) install and operate dewatering systems for the tunnel and station excavations, and (2) discharge the dewatering effluent if the water contains contaminants such as metals or petroleum hydrocarbons. The impacts associated with handling and disposal of contaminated dewatering effluent are further discussed in Section 5.21.14.

**Bedrock**. Impacts to the Terminal/Extension Project from poor quality bedrock would be limited to the cut-and-cover section under Second Street from Brannan Street to Folsom Street. Cut-and-cover construction in this area will make use of special shoring techniques discussed in Section 5.20.

### 5.21.18 SAFETY AND SECURITY

Evaluation of long-term project impacts on public safety and security is presented in Section 5.17. This section focuses only on the short-term safety and security impacts of construction activities.

Best construction management practices would be required to be in place to ensure the safety of construction workers, local residents, and employees during project construction. Fencing and lighting of construction and staging areas, and recognized safety practice requirements for the use of heavy equipment and the movement of construction materials would be implemented to avoid accidents. During construction, the Construction Manager would be responsible for job site safety and security. Emergency response personnel within San Francisco would be available for immediate response on an as-needed basis.

## 5.22 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The No-Project Alternative would not directly involve the use of resources, except insofar as it assumes implementation of planned and programmed capital improvements, which require money, materials, and labor to construct. This would include electrification of the entire Caltrain line from Gilroy to the Fourth and Townsend Streets Station in San Francisco and the need to upgrade or retrofit the existing Transbay Terminal to meet current seismic safety requirements. The Transbay Terminal / Caltrain Downtown Extension / Redevelopment project would involve major capital improvements, which would require money, materials, and labor, as shown in Tables 2.2-1, 2.2-2 and 2.2-3. Total project costs for the Locally Preferred Alternative are estimated to be $2.083 billion year-of-expenditure costs, including all project components.

Because the Transbay Terminal and Caltrain Downtown Extension Alternatives would reduce vehicle miles of travel within the region when compared to the No-Project Alternative, it would also reduce the level of vehicular fossil fuel consumption. Further reductions could occur because local transit operators (Muni and SamTrans) would no longer have to serve the Fourth and Townsend Streets terminal.

Operation of trains on the 1.3-mile extension would require the use of electricity for power, and would have greater propulsion energy requirements than the No-Project Alternative, although the energy requirements per passenger trip would be similar or less.

Operation of the new terminal would require the use of energy for lighting, heating, cooling, but the terminal would be designed to incorporate the latest sustainable features that would allow the building to use site-specific wind, daylight, and shading to reduce the building's energy needs. The design of the roof and exterior walls would facilitate natural ventilation and natural lighting of the interior. Use of mechanical cooling would be limited to enclosed office areas and data equipment rooms. Photovoltaic panels are proposed on the roof structure to capture solar energy. Rainwater would be collected and used for maintenance and irrigation of landscaping.

The new development proposed in the surrounding vicinity would also use energy for lighting, heating, and cooling, but this use would be somewhat offset by a reduction in the use of vehicular fuel, since these new residential, commercial, and retail spaces would be very close to a regional multi-modal transit hub. Automobile use should be less than it would be were the same level of development to be constructed in other, non-transit-oriented locations.

## 5.23 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The Transbay Terminal / Caltrain Downtown Extension / Redevelopment Alternatives would involve short-term uses of the environment during the construction period through the use of fuel and construction materials, through increases in noise levels and air pollutants, and through increases in traffic congestion and detours around construction sites. These short-term effects and uses of resources would result in long-term benefits such as improved access to downtown San Francisco from the Peninsula, improved connectivity between and among Caltrain and other regional transit systems, and a more vital mix of transit-oriented land uses in the Transbay Terminal vicinity, including housing. These improvements, when combined with the decrease in vehicle miles of travel on the regional highway network, improved air quality, and greater efficiency in energy consumption, would contribute to the long-term livability, and therefore productivity, of the region.

The current Transbay Terminal concept includes "a wide ranging sustainable approach to the terminal building that uses the natural wind flows in downtown San Francisco to ventilate and cool the facility, harnesses solar energy for passive hearing and cooling, and established sustainability protocols for materials, construction procedures, and long-term building operations."[51] Additional measures would be included in the design and specification of equipment to ensure energy efficiency, thereby helping to reduce the long-term energy requirements and the operating costs of the project.

[51] Transbay Terminal Improvement Plan, MTC, 2001, pg. 18.

# CHAPTER 6: FINANCIAL ANALYSIS

This chapter presents the proposed financial plan for the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project. The analysis is not required for environmental review but is presented for informational purposes. A financial plan, or program, is an important element of the project approval process. For a project to receive regional funds in the subsequent phases of design and construction, it must be included in a financially constrained Regional Transportation Plan (RTP). Likewise, eligibility for state funds requires inclusion in the State Transportation Improvement Plan (STIP). If the project is to receive federal funds or is subject to federally required actions, such as review for its impact on air quality, it must also be included in the federally required Transportation Improvement Program (TIP). *The 2003 Transportation Improvement Plan (TIP) was federally approved in February 2003. The proposed Project is included in the 2003 TIP for Preliminary Engineering and design.*

## 6.1 PROJECT DESCRIPTION

The proposed project has three major components:

- A new, multi-modal Transbay Terminal on the site of the present Transbay Terminal;
- Extension of Caltrain commuter rail service from its current San Francisco terminus at Fourth and Townsend Streets to a new underground terminus underneath the proposed new Transbay Terminal; and
- Establishment of a Redevelopment Area Plan with related development projects, including transit-oriented development in the vicinity of the new multi-modal Transbay Terminal.

Other subordinate components of the project include a temporary bus terminal facility to be used during construction of the new Transbay Terminal, a new, permanent off-site bus storage/layover facility, reconstructed bus ramps leading to the new Transbay Terminal, and a redesigned Caltrain storage yard. Figure 1.2-1 (in Chapter 1) shows the project location.

## 6.2 ESTIMATED CAPITAL COSTS

*The Draft EIS/DEIR reported that a rebuilt Transbay Terminal and the underground Caltrain Extension would cost between $1.898 and $2.141 billion in 2003 dollars. Since the publication of the Draft EIS/DEIR, the Transbay Joint Powers Authority has selected a Locally Preferred Alternative (LPA) consisting of the West Ramp option for the Transbay Terminal and tunnel construction along the Second-to-Main alignment for the Caltrain Downtown Extension. Subsequently, cost estimates have been refined and a value engineering exercise has been undertaken for this LPA. The resulting cost estimate is $1.754 billion in 2003 dollars, approximately $143.7 million less than the original cost estimate for this alternative.*

*Tables 6.2-1 and 6.2-2 provide more details of the capital costs of the proposed Project's components.* Cost estimates include net land acquisition costs and all agency costs for project oversight as well as general project contingency and reserve. The costs exclude any potential savings from value engineering. For more detail on capital costs of the project components, see Chapter 2.

***Table 6.2-1: Transbay Terminal Capital Cost Estimate***
***West Ramp Alternative (LPA)***
***(Millions of Dollars – Year of Expenditure)***

| *Activity* | *Cost Estimate* |
|---|---|
| *Operations Analysis, Preliminary Engineering, Geotechnical Engineering), Program Review/Value Engineering, Final Design & Permitting, Owner Costs* | *$107.87* |
| *Acquire Property, Design, Construct Temporary Terminals (Transit and Greyhound)* | *$28.29* |
| *Acquire Property & Demolish Buildings to Build Terminal* | *$36.54* |
| *Demolish Existing Terminal & Ramps, Construct New Terminal & Ramps* | *$909.22* |
| *Construct Permanent Off Site Bus Storage Facility* | *$24.45* |
| ***TOTAL COST ESTIMATE*** | ***$1,106.37*** |

*Notes:*

- *Costs escalated to year of anticipated expenditure between 2004 and 2011.*
- *Costs are for West Ramp Alternative*
- *Other qualifications and assumptions apply, including coordination with Caltrans during the retrofit of the Western Approach and bus ramp retrofit projects.*
- *Total assumes high end of 2001 real estate estimate escalated to year of expenditure.*
- *Construction costs include a 25% construction contingency, 8% for construction management, and 10% project reserve. Owner costs are factored into each category.*

***Source:*** *MTC, SMWM, Oppenheim/Lewis, Sedway Group, Parsons, 2003*

*As the relative value of money changes over time due to inflation and other factors, the financial plan has been formed to address costs and revenues in Year of Expenditure (YOE) dollars. Project cost estimates are originally prepared in current-year dollar amounts (such as 2003 dollars), and then spread over the construction schedule. In the financial analysis, these costs are escalated by an assumed inflation rate to calculate what the future project costs are likely to be in the year that the construction activities will occur. The resulting costs are thus expressed in Year of Expenditure dollars.*

*Soft costs assumed in the Final EIS/EIR are now consistent between the line items and reflect the following breakdown: 25 percent construction cost contingency; 10 percent project reserve; and a 25 percent contingency that includes 10 percent for design costs, eight percent for construction management, and seven percent for owner costs.*

*Table 6.2-2: Capital Cost Estimate for Caltrain Downtown Extension Second-to-Main Street Tunneling Option – Locally Preferred Alternative (Millions of Dollars – Year of Expenditure)*

| *Activity* | *Cost Estimate* | |
|---|---|---|
| *Operations Analysis, Preliminary Engineering, Geotechnical Engineering, Program Review/ Value Engineering, Final Design & Permitting, Owner Costs* | | *$76.83* |
| *Acquire Property & Demolish Buildings along Extension* | | |
| *Acquisition/Relocation for Train Subway* | *$82.85* | |
| *Demolition* | *$1.24* | |
| *Resale Proceeds* | *($31.12)* | |
| *Subtotal* | | *$52.97* |
| *Design and Relocate Utility Lines along Extension* | | *$52.90* |
| *Construct Surface Rail & Improvements at Train Yard* | | *$13.37* |
| *Construct Cut-and-Cover and Retained-Cut – Caltrain Extension* | | *$427.13* |
| *Reconstruct Streets* | | *$7.09* |
| *Construct Train Tunnel* | | *$287.70* |
| *Construct Track & Systems Facilities* | | *$58.54* |
| ***TOTAL COST ESTIMATE – Caltrain Downtown Extension*** | | ***$976.53*** |

*Notes:*

- *Costs escalated to year of anticipated expenditure between 2004 and 2011.*
- *Costs are for Second-to-Main Tunneling Alternative, the Locally Preferred Alternative.*
- *Total assumes high end of 2001 real estate estimate escalated to year of expenditure.*
- *Construction costs include a 25% construction contingency, 8% for construction management, and 10% project reserve. Owner costs are factored into each category.*
- *The optional underground pedestrian connection from the train mezzanine to The Embarcadero Muni Metro/BART Station is estimated to cost $45.3 million.*
- *An additional $235 million could need to be added to the Project costs for purchase of dual mode locomotives if the Caltrain corridor is not electrified.*

***Source:*** *Parsons, 2003*

## 6.3 ESTIMATED OPERATING COSTS AND OPERATING REVENUES

### 6.3.1 OPERATING AND MAINTENANCE COSTS

Anticipated ongoing operating and maintenance costs are discussed separately below for the Transbay Terminal and Caltrain Extension components. Labor and equipment would be the main costs for ongoing operation of the Caltrain extension. Moving the terminal from Fourth and Townsend to the Transbay Terminal, a distance of 1.3 miles, would have a modest effect on the total annual operating costs of Caltrain service. That cost, assuming 132 daily trains, is

estimated at roughly *$7.5* million per year in constant *2003* dollars. The necessary rolling stock is assumed to be in operation at the time the Caltrain Extension begins operation.

The new terminal building would feature a number of design features to reduce maintenance requirements and operating costs, including an open design to optimize natural ventilation by prevailing winds and maximize natural light, and a system to collect rainwater for maintenance and irrigation. Operating costs for the new facility are estimated to be about *$17.8* million per year in constant *2003* dollars.

### 6.3.2 Operating Revenues

With respect to Caltrain operations, the projected *$7.5* million per year increase in train operating costs due to the additional length of operations on the extension into the Transbay Terminal is expected to be funded by fare revenues from increased Caltrain ridership. With respect to the Transbay Terminal operations, long- term, ongoing operating revenues are anticipated from commercial leases in the Transbay Terminal. MTC Resolution No. 3434 includes a commitment of $62 million in bridge toll funds provided by BATA to be used as operating assistance for this new Transbay Terminal over a 25-year period. The Transbay Terminal is expected to have a positive cash flow on the order of *$4 to $5* million per year *in constant 2003 dollars*. The project would not divert any operating funds from existing bus services. Table 6.3-1 shows a conceptual operating plan for 10 years of revenue service beginning in 2010.

## 6.4 PROJECT'S INCLUSION IN REGIONAL TRANSPORTATION PLAN

The Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project is included as one of the top funding priorities in the financially constrained portion (called "Track 1") of MTC Resolution 3434.[1] MTC Resolution 3434 is the transit expansion element of the 2001 Regional Transportation Plan (RTP). The amended 2001 RTP was adopted by MTC on March 15, 2002.

## 6.5 ADDITIONAL FACTORS CONTRIBUTING TO FUNDING FEASIBILITY

The funding plan for the Transbay Terminal/Downtown Caltrain Extension/Redevelopment Project, presented in Section 6.6, is based on the application submitted by the San Francisco County Transportation Authority to MTC for inclusion of the Project in Resolution 3434 and the RTP.

[1] The Project is identified as the "Caltrain Downtown Extension/Rebuilt Transbay Terminal" in Resolution 3434 and the RTP.

*Table 6.3-1: Transbay Terminal and Caltrain Downtown Extension Conceptual Operating Plan – Cost and Revenue Estimates*
*(Thousands of 2003 Dollars)*

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Caltrain Downtown Extension** | | | | | | | | | | |
| Operating Expenses [1] | *$7,929* | *$7,929* | *$7,929* | *$7,929* | *$7,929* | *$7,929* | *$7,929* | *$7,929* | *$7,929* | *$7,929* |
| Operating Revenues [2] | *$9,142* | *$9,593* | *$9,680* | *$9,767* | *$9,855* | *$9,943* | *$10,033* | *$10,123* | *$10,214* | *$10,306* |
| Net Loss/ Surplus [3] | *$1,213* | *$1,664* | *$1,751* | *$1,838* | *$1,926* | *$2,014* | *$2,104* | *$2,194* | *$2,285* | *$2,377* |
| **Transbay Terminal** | | | | | | | | | | |
| Operating Expense [4] | *$17,849* | *$17,849* | *$17,849* | *$17,849* | *$17,849* | *$17,849* | *$17,849* | *$17,849* | *$17,849* | *$17,849* |
| Operating Revenues [5] | *$22,388* | *$22,388* | *$22,388* | *$22,388* | *$22,388* | *$23,241* | *$23,241* | *$23,241* | *$23,241* | *$23,241* |
| Net Loss/ Surplus | *$4,539* | *$4,539* | *$4,539* | *$4,539* | *$4,539* | *$5,392* | *$5,392* | *$5,392* | *$5,392* | *$5,392* |

Notes:

[1] From Manuel Padron *Final O&M Cost Results Report for Caltrain Downtown Extension Project*, 11/8/96, escalated to *2003* and adjusted for number of trains.

[2] Assumes average of $2.76 per ticket for 13,500 new riders attributable to the extension in 2020, with an annualization factor of 268.

[3] Use of excess revenues to be determined by the JPB.

[4] Based on Jones, Lang LaSalle Report (February 13, 2001) and July 2002 *and September 2003* revisions, and Nancy Whelan Associates, *September 2003.*

[5] Based on Jones, Lang LaSalle Report (February 13, 2001) and July 2002 *and September 2003* revisions, and Nancy Whelan Associates, *September 2003.* Includes $3 million in annual BATA bridge toll operating support per MTC Resolution 3434 (start date of 2010).

Source: Parsons Transportation Group, Nancy Whelan Consulting. *September 2003.*

MTC's process for selecting projects for inclusion in Resolution 3434 portion of the RTP included consideration by MTC of a number of criteria and factors intended to ensure the ability to deliver and to maximize performance of the region's investments in transit expansion. The Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project measured well against all criteria; hence MTC's decision to include it among the top priorities in the region. The following describe some of those factors and are included to further illustrate the value and importance of the Project to the regional transportation network.

*Subsequent to MTC's approval of Resolution 3434 and to preparation of the Draft EIS/DEIR, the project costs and revenues have been refined. The financial plan presented in Section 6.6 is consistent with Resolution 3434.*

### 6.5.1 Supportive Land Use Policies

The Caltrain Downtown extension to the new Transbay Terminal would connect the South Bay with the region's largest and densest concentration of employment – San Francisco's financial district. The proposed extension is consistent with the findings of MTC's *Blueprint* evaluation, which found that rail extensions capture significantly more ridership in the densely settled urban core of the region.

Even though much of downtown San Francisco is substantially built out, there are opportunities for additional development that would further increase Caltrain and bus ridership growth, thereby improving the project's cost effectiveness. *Within the limits of the Full Build Alternative analyzed in this Final EIS/EIR, the Redevelopment Agency's Draft Design for Development Plan (August 2003)for the Project Area* includes over *5.6* million square feet (sq. ft.) of residential/office/retail/hotel development, including approximately *4.1* million sq. ft. of residential development (nearly *3,400* residential units including *approximately 1,200* affordable *units*), nearly *1* million sq. ft. of office development, 475,000 sq. ft. of hotel development, and *neighborhood-serving* retail development.

*The redevelopment of the parcels being transferred from the State to the Transbay Joint Power Authority and the Redevelopment Agency would contribute funds directly to the Transbay Terminal / Caltrain Downtown Extension construction projects. This includes more than 5.0 million square feet (sq. ft.) of residential/office/retail/hotel development, including approximately 2,900 residential units (including more than 900 affordable units), nearly 1 million sq. ft. of office development, 475,000 sq. ft. of hotel development, and neighborhood-serving retail development, according to the Redevelopment Agency's Draft Design for Development Plan.*

Not only would transit-oriented development around the Transbay Terminal provide needed funding (through tax-increments), it would also increase the density of employment and residential units in the South of Market area. This would improve transit's ability to attract a larger mode share of persons commuting to jobs in the region. In addition, an unprecedented amount of development is projected in the southeastern part of San Francisco over the next 20

years. The Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project would provide another attractive transportation option to new residents and workers in that area.

San Francisco's General Plan and Planning Code have for several decades included policies and requirements to ensure transit-oriented, pedestrian-oriented, and mixed-use development (e.g. Transit First policy, transit impact development fees applied to the downtown commercial land uses, parking restrictions and disincentives, and other measures). These existing policies would contribute to the long-term success of the Terminal/Extension Project.

### 6.5.2 System Connectivity

Caltrain now terminates more than a mile away from the major employment concentrations of San Francisco's downtown office district, and far from the BART and Muni Metro stations on Market Street and from the existing Transbay Terminal. By extending the Caltrain terminus to the Transbay Terminal, the Project would act as a critical gap closure, improving inter-county travel via Caltrain, BART, Muni Metro, Golden Gate Transit, SamTrans, and AC Transit. One centrally located terminal would allow intermodal connections for direct access to seven Bay Area counties from one terminal. In addition, the extension is being designed to accommodate a possible future connection to the East Bay and the Capital Corridor service, which extends from San Jose to Sacramento and points north. The Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project has considerable potential to improve interregional travel by allowing centrally located connections to Greyhound, the Amtrak bus bridge to the East Bay, and a future statewide high-speed rail system.

Caltrain service levels have increased over the recent years to 80 trains per day. The Transportation Congestion Relief Program (TCRP) funding has been *allocated* to implement express service (designated "baby bullet" service). Improvements recommended in Caltrain's Rapid Rail Plan, including the construction of passing tracks, are being implemented at a rapid pace. Furthermore, the programmed electrification of the Caltrain would further increase service improvement options.

### 6.5.3 Transit System Access

The Caltrain Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project would offer exceptional multi-modal system access, more than any other rail extension project in the region. Many of the essential, complementary elements contributing to a high level of system access are already in place.

By terminating at the Transbay Terminal, Caltrain would facilitate seamless transfers among various local, intercity, and interregional bus and rail transit services, including AC Transit, Golden Gate Transit, Muni, Greyhound, Amtrak, SamTrans and future high-speed rail. The extension would be designed to allow additional transit, including rail, extensions to the East Bay

and Capital Corridor service. A new Transbay Terminal would provide pedestrian access to BART and Muni Metro on Market Street.

Under the Project, the Caltrain commuter rail terminus would be located in San Francisco's downtown office district, which has the highest volume of pedestrian traffic in the region. The area is characterized by high density, mixed land uses and a pedestrian-friendly urban environment featuring wide sidewalks, abundant ground floor retail, and narrow streets, among other features. San Francisco also has the highest volume of bicycle traffic in the region. Official bicycle routes (shared roadway) adjacent to the terminal include Second and Howard Streets. Nearby Market Street is an integral component of the city's bicycle network. Folsom Street, one block south of the terminal, has a bike lane. An attended bike station would operate at the Caltrain terminus station. Caltrain's handling of bicycles onboard trains is considered one of the best programs in the U.S. Caltrain now accommodates more than 2,000 bikes per day, a number that is growing rapidly.

The Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project would also offer travel time benefits for commuters along the entire Caltrain Corridor, including residents of San Francisco who would be offered five Caltrain station stops within the city. For example, the extension to the Transbay Terminal would reduce the travel time from the southern portions of San Francisco (e.g., Visitation Valley and Bayview), with the highest concentration of low-income population in San Francisco, to the downtown. In addition, the Transbay Terminal's centralized connections to the South Bay (via Caltrain and SamTrans), and East Bay (via AC Transit) would help to improve mobility for many low-income populations throughout the Region.

## 6.6 PROPOSED FUNDING BY SOURCE

Table 6.6-1 presents *a funding plan for the LPA that was adopted by the TJPA Board and* described in Chapter 2). These funding options are based on the funding plan developed jointly by the City and County of San Francisco, the San Francisco County Transportation Authority, the JPB, and MTC as part of MTC Resolution 3434. The financial plan in this *Final EIS/EIR* is based on financial projections and governmental actions that are not finalized.

*As noted in Section 6.2, the original capital cost estimate for the West Ramp, Second-to-Main, tunnel construction option has been refined based on value engineering. The resulting cost estimate is $1.754 billion in 2003 dollars, approximately $143.7 million less than the original cost estimate for this alternative.*

**Table 6.6-1: Project Estimated Capital Costs and Funding Sources (Millions of YOE Dollars)**

| Transbay Terminal | West Ramp |
|---|---|
| Caltrain Extension Alternative | Second-to-Main Tunnel Option |
| **Capital Costs and TIFIA Debt Service** | |
| Total Capital | $2,082.9 |
| Debt Service | $1,857.2 |
| Total Cost | $3,940.1 |
| **Funding Source** | |
| *Local/State* | |
| Regional Measure 1 | $53.0 |
| RTIP [1] | $23.0 |
| San Mateo Sales Tax [2] | $27.0 |
| San Francisco Sales Tax Reauthorization [3] | $295.0 |
| AB1171 [*4*] | $150.0 |
| Land Sales [*5*] | $287.9 |
| Tax Increment [*6*] | $534.2 |
| Net Operating Revenues [*7*] | $140.2 |
| Bridge Toll Increase (SB 916) [*8*] | $150.0 |
| High Speed Rail Bonds [*9*] | $475.0 |
| Other [*10*] | $*182.5* |
| PFC [*11*] | $873.0 |
| Leveraged Lease Transaction [*12*] | $50.2 |
| *Federal* | |
| TIFIA Loan | $689.7 |
| Section 1601 [*13*] | $9.4 |
| **Total Funds** | **$3,940.1** |

**Notes:**

[1] Per MTC's RTP, which assumes $23 million in RTIP (Regional Transportation Improvement Program), STP (Surface Transportation Program), and CMAQ (Congestion Mitigation and Air Quality Improvement Program) funds.

[2] San Mateo County contribution (per MTC's RTP).

*[3] San Francisco County contribution per Expenditure Plan for the Reauthorization of the Local Sales Tax for Transportation, approved June 17, 2003, escalated to YOE $s. Approved by voters November 2003.*

[*4*] Per MTC's RTP. New Source of discretionary funds to MTC, pursuant to State law passed in October 2001 to complete the seismic retrofit of Bay Area bridges and related projects, consistent with Regional Measure 1.

[*5*] Per *valuation by CB Richard Ellis for San Francisco Redevelopment Agency, August 2003, escalated to year of expenditure.*

[*6*] Tax Increment amounts from Seifel Consulting, *August 8, 2003 for San Francisco Redevelopment Agency.*

[*7*] Per Jones, Lang LaSalle and Nancy Whelan Consulting, *September 2003.* Includes $3 million in annual BATA bridge toll operating support per MTC Resolution 3434 *and SB 916 (proposed).*

*[8] Regional Measure 2, which includes $150 million for the Project, was passed by the voters in Bay Area counties on March 2, 2004.*

[*9*] *Per SB 1856, funding for the Caltrain Downtown Extension may be provided as a part of the High Speed Rail bond initiative. The bond may be approved by the voters in November 2004.*

[*10*] Other includes potential funding from the following sources: Proposition 42, *federal earmarks* and *additional local sales tax.*

[*11*] A Passenger Facility Charge (PFC) is assumed for Caltrain, AC Transit *and High Speed Rail* passengers. The PCF would be *$0.75 for Caltrain passengers, $0.25 for AC Transit passengers and $3 for High Speed Rail passengers.*

[*12*] The Terminal Facility's value is assumed to be $1.003 or $1.163 billion and the net benefit rate to be 5%. Leveraged lease transactions are encouraged by the FTA as innovative financing mechanism.

[*13*] Per MTC's RTP, which assumes $9.37 million in Section 1601 design grant.

**Sources:** San Francisco County Transportation Authority, Seifel Consulting, Jones, Lang LaSalle, Openheim/Lewis, Peninsula Corridor Joint Powers Board, Sedway Group, Nancy Whelan Consulting, Parsons Transportation Group, 2001, 2002, *2003, and 2004.*

*As the relative value of money changes over time due to inflation and other factors, the financial plan has been formed to address costs and revenues in Year of Expenditure (YOE) dollars. Project cost estimates are originally prepared in current-year dollar amounts (such as 2003 dollars), and then spread over the construction schedule. In the financial analysis, these costs are escalated by an assumed inflation rate to calculate what the future project costs are likely to be in the year that the construction activities will occur. The resulting Year of Expenditure cost for this alternative is $2.083 billion (YOE).*

Table 6.6-1 identifies revenue sources to fund the expected financing cost of the project. The other funding options have also been developed using Resolution 3434 funding plan as the point of departure, with adjustments as necessary within the framework of project eligibility and assumed overall availability of the different funding sources.

While additional consideration could be given to the relative contribution of various funding sources to the project, to avoid speculation regarding the funding sources to be used and the viability of the financially constrained plan, the variations on the funding plan shown in Table 6.6-1 are based on existing funding sources. There are, however, prospects for additional funding from new sources, as discussed in Section 6.6.3 below. Various funding sources are discussed in the following sections.

### 6.6.1 FEDERAL FUNDS

The Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project received an earmark of $9.375 million under Section 1601 of the Transportation Equity Act for the 21st Century (TEA-21). MTC has included the $9.375 million earmark in the 2002 Transportation Improvement Program (TIP). Consistent with MTC Resolution 3434, the funding plan does not include any "new starts" funding (see Table 6.2-1), and it assumes a relatively small contribution of local discretionary RTIP/STP/CMAQ (Regional Transportation Improvement Program/ Surface Transportation Program/Congestion Mitigation and Air Quality Improvement Program) funds.

The funding plan assumes receipt of a loan from the Transportation Finance and Innovation Act (TIFIA), which provides low interest, subordinated government loans and loan guarantees. All improvements to the Transbay Terminal/Extension project could be classified as Transportation Improvements under Title 23 and are therefore eligible for a subordinated loan from the federal government as a part of USDOT's TIFIA program, which was authorized in TEA-21. This program may provide various forms of credit support for large transportation projects for up to one-third of a project's total cost. A direct subordinated loan under this program will be very important in the financing plan for the Transbay Terminal/Caltrain Downtown Extension Project in providing maximum leverage of scarce project revenue dollars.

Revenues that could be pledged to such a loan include:

- Toll funds,
- Lease income on retail space within the terminal,
- Lease of properties transferred to the Transbay Joint Powers Authority,
- Tax Increment Revenues on project areas created by the San Francisco Redevelopment Agency, and
- Passenger facility fees.

### 6.6.2 STATE FUNDS

In October 2001, Governor Davis directed the State Transportation Department (Caltrans) to initiate the administrative transfer of state-owned land parcels in San Francisco. *This process is nearing completion.* The land, worth approximately *$288* million to the project, will be transferred to the Transbay Joint Powers Authority and to the City and/or the San Francisco Redevelopment Agency. The entire assessed fair market value at the time the property is transferred from Caltrans will be applied to the construction of the proposed Transbay Terminal/Downtown Extension.

### 6.6.3 REGIONAL AND LOCAL FUNDS

In addition to the proceeds from the sale of the land, the project is projected to receive $53 million in Regional Measure 1 funds, and tax increment revenues, passenger facility fees, surplus operating revenues *(including BATA bridge toll revenues)*, and other revenues, for a total of about $3.2 billion in local and state funding.

High revenue potential from the property tax increments of redevelopment in the vicinity of the Transbay Terminal is possible because of intensity of land uses in a city such as San Francisco and the prime location of the terminal. Commercial leases in the Terminal are also assumed to generate substantial revenues, given that retail space is included in the current conceptual designs for the terminal, that this space is included in the estimated capital costs, and that the retail space is anticipated to provide services to a substantial number of transit patrons and other downtown workers.

MTC Resolution 3434 includes $150 million in AB 1171 funds for the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project. This source results from the adoption of AB 1171 by the California Legislature for a plan to fund the costs of seismic retrofit of Bay Area toll bridges. The project is eligible for these funds, which are discretionary to MTC, under a provision that makes the money available to projects consistent with the purposes of the voter-approved Regional Measure 1 program, which includes congestion relief in the corridors served by the proposed project, particularly the Transbay corridor.

The project enjoys solid local support in San Francisco as evidenced by the passage of Proposition H in 1999 by a 69.1 percent of the voters. Proposition H makes construction of the Caltrain Extension Project the official policy of the City and County of San Francisco. Although not necessary to establish a strong local funding share for the project, the regional nature of the project would warrant the allocation of regional funds to help defray construction costs. The City and County of San Francisco and the San Francisco County Transportation Authority *have included $270 million in 2003 dollars for the project in the New Transportation Expenditure Plan for San Francisco adopted on July 22, 2003 and approved by the voters in November 2003. The passage of Proposition K, the San Francisco sales tax reauthorization, in November resulted in the elimination of Interregional Transportation Improvement Program (ITIP) funds from the financial plan. As stated in MTC's Resolution 3434, Attachment D, "The ITIP commitment to the project will be reduced by $59 million if a rollover of San Francisco's sales tax is approved."*

A terminal use fee or passenger facility charge (PFC) is also assumed to be applied to all passengers using the Transbay Terminal. *A fee of $0.75 and $0.25* would be applied to Caltrain and AC Transit riders using the terminal, *respectively. A PFC of $2.00 would be applied to high-speed rail passengers.* This fee is estimated to generate revenues of about *$2.5 billion* over *35* years, *assuming that the fees are escalated to keep pace with inflation.*

*The financial plan assumes that the California High Speed Rail Authority will include funding for the Transbay Terminal and Caltrain Downtown Extension project in its upcoming bond measure. While the actual commitment has yet to be determined, this financial plan assumes a contribution of $475 million from the $9.95 billion bond measure planned for the November 2004 ballot.*

Options to reduce project costs, e.g., application of design-build, will be pursued, as will innovative financing mechanisms such as a leveraged lease transaction. Leveraged lease transactions are encouraged by the FTA as an innovative financing mechanism. For the West Ramp Alternative options, the value of a leveraged lease transaction would be about $50 million.

Should the above funding sources prove inadequate for financing the project, additional funding sources will be pursued. At the state level, these additional sources could include new transportation infrastructure funding at the State levels *and* additional State sales tax revenues. Legislative approval would be required for these additional sources. *Given the current status of the State budget, Prop. 42 revenues to this project may not materialize. Accordingly, the revised project funding plan does not rely on Prop. 42 revenues.*

At the federal level, multimodal facility funding under the reauthorization of TEA-21 could be pursued as well as potential federal high-speed rail funding *and earmarks.* Multiple high-speed rail bills are currently pending before Congress.

# CHAPTER 7: CEQA TOPICS AND FINDINGS OF SIGNIFICANCE

This chapter describes those potential environmental effects identified in Chapter 5 that would be considered significant under the California Environmental Quality Act (CEQA). Potential cumulative impacts are also described, and the potential for the project to stimulate unplanned growth is considered.

While CEQA requires that a determination of significant impacts be stated in an EIS/EIR, the National Environmental Policy Act (NEPA) does not. Under NEPA, significance is used to determine whether an EIS or some other level of documentation is required, and once a decision to prepare an EIS is made, the magnitude of the impact is evaluated and no further judgment of its significance is required. For this reason, the CEQA significance criteria and the determination of significant impacts have not been included in other sections of this combined NEPA/CEQA EIS/EIR. Instead, those criteria and determinations have been grouped in this chapter, titled "CEQA Findings of Significance."

It should be noted that although the presence of mitigation under CEQA creates a presumption of significant impacts, NEPA anticipates that an EIS will identify means to mitigate the adverse impacts of a project if such measures are not already included in the proposed action or alternatives. For this reason, some mitigation measures described in this document and in this section are wholly appropriate under NEPA, although the impacts they address may not be considered significant under CEQA.

## 7.1 SIGNIFICANCE CRITERIA

CEQA requires that an EIR identify the significant environmental effects of the project (CEQA Guidelines Section 15126), but does not provide thresholds for significance. Instead, CEQA Guidelines Section 15064(b) states that "the determination . . . calls for careful judgment on the part of the public agency involved . . . " and that "an ironclad definition of significant effect is not possible because the significance of an activity may vary with the setting." In the current analysis, the City and County of San Francisco and the Joint Powers Board have given careful consideration to the issue of significance. As a result, the significance criteria shown in Table 7.1-1 have been used to evaluate the environmental impact categories indicated.

**Table 7.1-1: CEQA Significance Thresholds For Selected Environmental Impact Categories**

| DEIS/ DEIR Sec. No | IMPACT CATEGORY | EXPLANATION OF CEQA SIGNIFICANCE THRESHOLD | SOURCE(S) |
|---|---|---|---|
| 5.1.1 | Land Use | A significant impact would occur if the project would substantially disrupt or divide the physical arrangement of an established community; or have a substantial adverse impact upon the existing character of the vicinity. | State CEQA Guidelines Appendix G |
| 5.1.2 | Wind | The project would have a significant impact if it would cause the City of San Francisco's wind hazard criterion (26 miles per hour) for more than one full hour per year. | San Francisco Planning Code Section 148 |
| 5.1.3 | Shadow | A project would have a significant effect if it would result in substantial new shadow on public open space under the jurisdiction of the Recreation and Park Commission during the period from one hour after sunrise to one hour before sunset, at any time of the year. | San Francisco Planning Code Section 295 |
| 5.2 | Residential/ Business Displacement | A significant impact would occur if the project would displace substantial numbers of people requiring the construction of replacement housing elsewhere. | State CEQA Guidelines, Appendix G |
| 5.4, 5.5 | Community Facilities & Services; Parklands, Schools & Churches | A significant impact would occur if the project would: (a) conflict with established recreational, educational or religious uses; (b) conflict with adopted plans and goals of the community; (c) create additional demand for public service facilities, the expansion of which would result in environmental impact. | Derived from State CEQA Guidelines Appendix G |
| 5.7 | Air Quality | A significant impact would occur if the project would violate any ambient air quality standard (NAAQS or CAAQS), increase the number or frequency of violations, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. | State CEQA Guidelines, Appendix G; US EPA; BAAQMD |
| 5.8 | Noise | A significant impact would occur if the project would substantially increase the ambient noise levels for adjoining areas. A noise increase of 10 db is perceived as a doubling of noise, and is generally considered substantial. (See Section 5.8 for a discussion of the FTA Noise Criteria, which determine "impact" and "severe impact" under NEPA). | Derived from State CEQA Guidelines, Appendix G |

**Table 7.1-1: CEQA Significance Thresholds For Selected Environmental Impact Categories**

| DEIS/ DEIR Sec. No | IMPACT CATEGORY | EXPLANATION OF CEQA SIGNIFICANCE THRESHOLD | SOURCE(S) |
|---|---|---|---|
| 5.8 | Vibration | A significant impact would occur if the project would create intrusive vibration substantially affecting adjacent land uses. Vibration of 75 VdB is generally considered intrusive for residential land uses. (See Section 5.8 for a discussion of the FTA Vibration Criteria). | Derived from State CEQA Guidelines, Appendix G |
| 5.9 | Geology/ Seismicity | A significant impact would occur if the project would expose people or structures to major geologic hazards. | State CEQA Guidelines, Appendix G |
| 5.10, 5.11 | Water Resources | A significant impact would occur if the project would cause substantial flooding, erosion, or siltation, or would substantially degrade water quality, or would substantially degrade or deplete ground water resources. | State CEQA Guidelines, Appendix G |
| 5.14 | Cultural & Historic Resources | A project is normally found to have a significant impact on the environment if the project would have a substantial adverse change to an historic resource – either an archaeological site, an historic architectural structure, or an historic district.<br><br>A "historic resource" is defined as a resource that is listed in or determined eligible for listing in the California Register of Historic Resources; listed in or determined eligible for listing in the National Register of Historic Places; one that is included as significant in a locally adopted register such as Article 10 and 11 of the San Francisco Planning Code; or one determined by the lead agency to be historically significant. A resource that is deemed significant due to its identification in a historic resource survey that meets the criteria of Public Resources Code Section 5024.1(g) would be presumed an historic resource unless a preponderance of evidence demonstrates otherwise. A "substantial adverse change" is defined as demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the resource would be materially impaired (a major change to the defining elements of historic character). | Derived from State CEQA Guidelines (Sec. 15064.5 and 15065(a); Appendix G; CEQA Sec. 21084.1, and City and County of San Francisco Planning Department. |

**Table 7.1-1: CEQA Significance Thresholds For Selected Environmental Impact Categories**

| DEIS/ DEIR Sec. No | IMPACT CATEGORY | EXPLANATION OF CEQA SIGNIFICANCE THRESHOLD | SOURCE(S) |
|---|---|---|---|
| 5.15 | Hazardous Waste | A significant impact would occur if the project would create a potential public health hazard involving the use, production, or disposal of materials which pose a hazard to people or animal or plant populations in the area affected. (Quantitative hazardous waste criteria exist for specific materials and constituents.) | Derived from State CEQA Guidelines, Appendix G |
| 5.16 | Visual Changes | The project would have a significant effect on the environment if it would have a substantial effect on a scenic vista, substantially degrade or obstruct publicly accessible views; substantially degrade the existing visual character or the quality of the area, or result in a substantial, demonstrable negative aesthetic effect; or generate obtrusive light or glare that would adversely affect views or substantially affect other properties. | Derived from State CEQA Guidelines, Appendix G |
| 5.18 | Energy | A significant impact would occur if the project would encourage activities which result in the use of large amounts of fuel, water or energy; or use fuel, water, or energy in a wasteful manner. | State CEQA Guidelines, Appendix G |
| 5.19 | Transit Services & Accessibility | A significant impact would occur if a project would cause a substantial project-specific or cumulative increase in transit demand that cannot be accommodated by existing or proposed transit capacity resulting in unacceptable levels of transit service. When considering cumulative development in the area, an adverse impact would also be created if the project contributed substantially to the deterioration of transit service or caused a substantial conflict with transit operations. | San Francisco Planning Department |

**Table 7.1-1: CEQA Significance Thresholds For Selected Environmental Impact Categories**

| DEIS/ DEIR Sec. No | IMPACT CATEGORY | EXPLANATION OF CEQA SIGNIFICANCE THRESHOLD | SOURCE(S) |
|---|---|---|---|
| 5.19 | Traffic Congestion | In San Francisco, the threshold for a significant adverse impact on traffic has been established as the deterioration in the level-of-service (LOS) at a signalized intersection to LOS E or F (i.e., a deterioration from LOS D or better to LOS E or F), or if an intersection at LOS E deteriorates to LOS F. An intersection that is at LOS E or F in the existing condition may be a significant adverse impact depending on the magnitude of the project's contribution to worsening of delay. In addition, a project would have a significant adverse effect if it would cause major traffic hazards, or would contribute considerably to cumulative traffic increases that would cause deterioration in levels of service to unacceptable levels. (See Sections 3.2 for a definition of LOS and a quantification of associated delay.) | San Francisco Planning Department |
| 5.19 | Traffic Circulation | A significant impact would occur if the project would substantially change traffic circulation patterns, creating an unusual safety hazard, or eliminating access to surrounding areas. | Derived from State CEQA Guidelines Section 15382. |
| 5.19 | Parking Displacement | The displacement of parking spaces is not generally considered a significant physical environmental effect but is a social effect and an inconvenience to those who must seek other parking. The displacement of parking spaces and any resulting parking deficits are also not considered to be a permanent condition as drivers may be induced to seek and find alternative parking facilities and shift to other modes of travel. Therefore, parking shortages are considered to be social effects rather than impacts on the physical environment. | San Francisco Planning Department |
| 5.21 | Temporary Construction Period Effects | Construction impacts on traffic, transit, noise, air quality, and the visual environment would generally not be considered significant since construction-related changes are by their nature temporary. A significant impact would occur only if temporary effects substantially affected accessibility to an area for a long period of time, or posed a severe health or safety threat. | Derived from State CEQA Guidelines, Section 15382 |

**Source:** Parsons Transportation Group and other sources as noted, September 2001.

Some impact categories lend themselves to scientific or mathematical analysis, and therefore to quantification. For other impact categories that are more qualitative or are entirely dependent on the immediate setting, a hard-and-fast threshold is not generally feasible. In these cases, the definition of significant effects from the CEQA Guidelines (Section 15382) has been applied as the significance criterion: "a substantial adverse change in physical conditions." Where a potential impact category is not relevant to the current project (potential impact on floodplains is a good example), no significance criterion is presented. Also, unlike NEPA, CEQA does not require a discussion of socioeconomic effects, except where they would result in physical changes, and states that social or economic effects shall not be treated as significant effects (see CEQA Guidelines Sections 15064(f) and 15131). For this reason, socioeconomic impact categories are not included in Table 7.1-1.

## 7.2 UNAVOIDABLE SIGNIFICANT ADVERSE EFFECTS UNDER CEQA

### 7.2.1 *EFFECTS ON HISTORIC RESOURCES*

Construction of a new Transbay Terminal and the Caltrain Downtown Extension would require demolition of properties listed in the National Register of Historic Places (NRHP), *or properties that are individually eligible for listing or that are contributors to multi-component properties or districts that are or appear eligible for listing. These properties are described in Section 5.14.* The existing Transbay Terminal and associated bus ramps *and approach structures would be demolished to construct the new Transbay Terminal component of the Project. These demolitions would constitute significant adverse effects under CEQA.*

Under either Caltrain Downtown Extension alternative, the Cut-and-Cover Option would result in the demolition of an additional *13* properties *that are individually eligible or that are contributors to a district that is or appears* eligible for listing in the NRHP. *Also, three buildings that are contributors to the Second and Howard Historic District / New Montgomery – Second Street Conservation District that would not be demolished would be isolated from the remainder of the district; this would constitute a substantial adverse change to the district.*

The Tunneling Option for *the Townsend Street to Folsom Street segment of* either of the Caltrain Downtown Extension alternatives would result in the demolition of ten *fewer* buildings than under the Cut-and-Cover Option, *but three buildings that are either individually eligible or that are contributors to a historic district that is eligible would still be demolished, and three other contributory buildings would still be isolated from the remainder of the district, as described in the preceding paragraph. These effects would constitute a substantial adverse change.* In general, projects that result in the substantial alteration or demolition of a recognized historic resource would be considered to have a significant effect on the environment.

### 7.2.2 *EFFECTS ON TRAFFIC AND CIRCULATION*

Although the project would result in a reduction in regional vehicle miles traveled (VMT), there would be unavoidable significant traffic impacts at the following seven intersections in the vicinity of the Transbay Terminal. These significant effects would occur under both the 2020 baseline plus the project and the 2020 cumulative conditions plus the project.

- First/Market
- First/Mission
- First/Howard
- Fremont/Howard
- Beale/Howard
- Second/Folsom and
- Second/Bryant

The predicted levels of service (LOS) at these intersections (identified in Table 5.19-4 in Section 5.19) would exceed the San Francisco CEQA thresholds of significance.

## 7.3 CUMULATIVE EFFECTS

CEQA defines cumulative impacts as "two or more individual effects which, when considered together are considerable," and suggests that cumulative impacts may "result from individually minor but collectively significant projects taking place over a period of time" (State CEQA Guidelines Section 15355). CEQA documents are required to include a discussion of potential cumulative effects *when those effects are significant* and the State CEQA Guidelines suggest two possible methods for assessing potential cumulative effects (State CEQA Guidelines Section 15130). The first method is a list-based approach, which considers a list of past, present, and reasonably foreseeable future projects producing related or cumulative impacts. The second method is projections-based, and uses a summary of projections contained in an adopted general plan or related planning document that is designed to evaluate regional or areawide conditions. The projections-based method is generally used by San Francisco in evaluating projects within its jurisdiction.

While the use of regional projections is one possible method of analyzing cumulative effects under CEQA, it is the required method under NEPA. FTA guidelines require that regional growth projections from the metropolitan planning organization (MTC in this case) be used as input for the assumed future year conditions.

The San Francisco County Transportation Authority (SFCTA) countywide travel demand forecasting model (SFCTA Model) was used to develop the travel forecasts for development and growth through the year 2020 in the region, as well as to determine travel demand to and from the South of Market area (area roughly bounded by The Embarcadero, Market Street, South Van Ness Avenue and King Street). This approach results in an impacts assessment for year 2020

conditions that takes into account both the future development expected in the South of Market area, as well as the expected growth in housing and employment for the remainder of San Francisco and the nine-county Bay Area.

The most up-to-date version of the SFCTA Model estimates future traffic and transit travel demand for the entire nine-county Bay Area region based on land use and employment forecasts prepared by the San Francisco Planning Department for the county, plus regional growth estimates developed and adopted by the Association of Bay Area Governments (ABAG) in 1998 (Projections '98) for the remainder of the Bay Area region. Travel demand was estimated for three land use scenarios:

- **2020 No Project,** which assumed future development and growth, consistent with the ABAG forecasts for San Francisco and the Bay Area, and incorporates projects that have recently been approved or entitled in the South of Market area.
- **2020 Project,** which included the additional development associated with the Terminal/Extension Project.
- **2020 Cumulative,** which incorporated other plans recently proposed in the South of Market area including the Rincon Hill Rezoning and the South of Market Redevelopment Area Plan, the Mid-Market Redevelopment Area Plan, and the Terminal/Extension Project. As a result, the year 2020 cumulative conditions forecasts used in the analysis exceed the ABAG forecasts for San Francisco for employment by about 2.8 percent, and household population by about 1.4 percent.

### 7.3.1 Regional Context

Because this document is based on accepted, regional land use forecasts for 2020, and assumes transportation improvements programmed within the same time frame, effects evaluated with the project include the cumulative effects of development within the region. Thus, additional analysis of potential cumulative effects related to specific development and transportation improvement projects within the region is not necessary. Impact categories for which the project effects presented in Chapter 5 already present cumulative conditions include the following: land use, transportation (including traffic and transit), air quality, and noise.

### 7.3.2 Local Context

Potential cumulative effects are not always regional in scope, and the current project was analyzed to determine whether less than significant environmental effects that would be experienced locally could become significant when considered with other reasonably foreseeable future projects in the project area. Reasonably foreseeable future projects are here defined as the projects assumed in the 2020 No-Project Alternative and described in Section 2.1, other plans recently proposed in the local South of Market area including, the Rincon Hill Rezoning and the

South of Market Redevelopment Area Plan, the Mid-Market Redevelopment Area Plan, and the Terminal/Extension Project. As noted above the inclusion of these local plans results in a 2020 cumulative scenario that exceeds the ABAG forecasts for San Francisco for employment by about 2.8 percent, and household population by about 1.4 percent.

To assess the effects of the vehicle-trips generated by the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project on 2020 Cumulative local traffic conditions, the contribution of the Project (Assuming the Full Build Redevelopment Alternative) to the 2020 Cumulative traffic volumes was determined. Results of the traffic analyses for these land use scenarios are provided in Section 5.19.4

### *7.3.3 Cumulative Visual Impacts*

*The determination of visual effect is by its very nature is subjective. Potential changes to the San Francisco greater downtown cityscape are shown in Figure 5.16-3. This graphic from the Redevelopment Agency's Draft Design for Development Vision shows a possible urban form resulting from proposed changes to the height and bulk in the Transbay Redevelopment Area. The reasonably foreseeable proposed projects within the Rincon Hill area are also shown. In addition to these projects, the Rincon Hill Mixed Use District is currently undergoing environmental review for proposed changes to zoning with increased height allowances and revised bulk requirements that would allow additional tall towers to be developed. This Rincon Hill Mixed Use District development along with Transbay Redevelopment Plan and other development in the area would result in loss of some existing views, both short- and long-range, from such citywide open spaces as Dolores Park, Twin Peaks, and Potrero Hill. From these sites, the downtown core area would appear larger as it would be extended southward toward the Bay Bridge. This would be a distinct visual change from existing conditions with lower-rise structures to an intensive view of urbanization. A similar change to a more intensive urban view would be expected from viewpoints on Treasure Island.*

*Likewise from the Bay Bridge, there would be a segment of the Bridge where the views both short- and long-range would change with the full implementation of the Transbay and Rincon plans. With implementation of the Transbay cumulatively with the Rincon Mixed Use district, the more urban downtown core would be closer to the Bridge, changing the views from vehicles traveling along the segment of the highway adjacent to Rincon Hill. These changed visual features are commonly accepted in urban areas and would not substantially degrade existing visual quality or obstruct publicly accessible views; however, the types of views would change to a more intensive urban visual character. However, while changing views, the project would not result in a demonstrative cumulative adverse aesthetic effect.*

## 7.4 GROWTH INDUCEMENT

This section considers whether the Caltrain Extension to the Transbay Terminal Site Alternative would encourage development in excess of amounts expected and provided for in the region

and/or San Francisco. Growth inducement would occur if the amount of population or employment growth projected to occur as a result of the project would exceed planned levels. Increased development and growth in an area are dependent on a variety of factors, including employment and other opportunities, availability of developable land, and availability of infrastructure, water, and power resources.

Transportation projects are potentially growth inducing when they extend service to the edge of an urban area, reducing travel times and improving access between employment opportunities and vacant or underdeveloped land to the extent that the travel time savings and enhanced accessibility outweigh other factors affecting locational decisions.

The Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project is being designed to facilitate planned growth on under-utilized properties in the heart of downtown San Francisco. An important goal of the project is to promote a vibrant new mixed-use neighborhood in an urban center, and enhance public transit access in this area. The redevelopment component of the project would provide a mix of residential and commercial development in a pedestrian-oriented neighborhood, which is consistent with the existing urban character of the Transbay Terminal area. The proposed Transbay Terminal would also provide a hub, bringing a large, transit-user population into a confined area, focusing opportunities for economic/joint development on the site, and potentially stimulating economic activity in the general vicinity.

Transit travel times with the Downtown Extension alternatives are projected to decrease by as much as 15 minutes. These time savings, while sufficient to attract additional riders to Caltrain, are not expected to induce unwanted or unplanned growth, both because they are not great enough to offset other locational factors, and because the project would extend an existing rail corridor, within a region that is already developed.

Modest growth is expected in the region by 2020, and San Francisco population is expected to grow approximately 11.7 percent from 723,959 in 1990 to 808,798 by 2020. At the same time, jobs are expected to grow 19.4 percent from about 566,648 in 1990 to about 731,664 in 2020, with some shift in downtown jobs to the South of Market Area. The primary factors causing the magnitude of this growth, such as the regional economy, availability of services, and so on, are independent of the proposed project.

In the context of downtown San Francisco, opportunities created by the Transbay Terminal/Caltrain Downtown Extension/ Redevelopment Project would not be expected to stimulate unplanned growth, but would rather facilitate the distribution of projected growth to available sites, and facilitate development activities consistent with the *San Francisco General Plan*.

# CHAPTER 8: *FINAL SECTION* 4(f) EVALUATION

## 8.1 INTRODUCTION

*This final Section 4(f) evaluation is an update and refinement of the Draft Section 4(f) Evaluation that was circulated for public comment as part of the Draft EIS/EIR from October 4 to December 20, 2002. Three public hearings and an open house were held on November 12, November 13 (including the open house), and November 26, and public comments were taken at all four meetings. The public comment period on the Draft EIS/EIR ended on December 20, 2002.*

*A Locally Preferred Alternative has been identified after consideration of the information presented in the Draft EIS/EIR, public and agency input from the circulation of the Draft EIS/EIR, meetings among affected stakeholders, community meetings and workshops, and the public hearings. The Locally Preferred Alternative consists of the following project components: the Transbay Terminal West Ramp Alternative with its associated bus ramps, circulation, and off-site storage; the Caltrain Downtown Extension with the "stacked drift" tunneling option for the segment between Townsend Street and Folsom Street and the Second –to-Main Alternative alignment north of there; and the Transbay Redevelopment Plan Area "full build" development alternative.*

This discussion complies with the federal requirements found in 49 USC, Section 303, commonly referred to as Section 4(f). These requirements pertain to all actions or projects undertaken by agencies within the U.S. Department of Transportation, including the Federal Transit Administration (FTA). The essence of *Section* 4(f) requirements is that special efforts are to be made to protect public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The law states that the Secretary of Transportation shall approve a project which requires the use of land from a significant publicly-owned park, recreation area, wildlife or waterfowl refuge, or historic site of significance only if (1) there is no prudent and feasible alternative to the use of that land and (2) the project includes all possible planning to minimize harm to the resource being affected by that use.

As defined under Section 4(f), use occurs when protected land is permanently acquired for a transportation facility, when a temporary use is considered adverse, or when there is "constructive use" of the resource. Constructive use occurs when indirect impacts are so severe that the activities, features, or attributes that qualify the resource for protection are substantially impaired.

*The Locally Preferred Alternative will use Section 4(f) resources through direct acquisition and temporary occupancy, but it does not involve any constructive use.* Pursuant to DOT Rules and Regulations, Part 771 Section 771.135 (p) (5) (I), constructive use of an historic property does not occur when "compliance with the requirements of Section 106 of the National Historic Preservation Act and 36 CFR Part 800 for proximity impacts of the proposed action . . . results in an agreement of . . . no adverse effect.'" Because the proximity impacts of the project *on historic properties (other than those that would be directly used)* have been determined to result in "no adverse effect" *under*

*Section 106 regulation,* these *proximity* impacts would not result in a constructive use of the *historic resources in question.*

Section 4(f) applies to the present project because both Transbay Terminal alternatives would require the use of land from the site of the Transbay Terminal, demolition *and removal* of the Transbay Terminal building, and demolition and removal of the terminal loop ramp *structures* that connect the terminal to the San Francisco-Oakland Bay Bridge. The terminal loop ramp *structures* and the terminal are contribut*ing* elements of the Bay Bridge, which is *listed on the National Register of Historic Places (NRHP).*

In addition, either Caltrain Downtown Extension Alternative using cut-and-cover construction would require demolition and removal of 13 other buildings that are contributors to a historic district that is, by *consensus of the Section 106 consulting parties,* eligible for the NRHP. Either Caltrain Downtown Extension Alternative constructed using the tunneling *option for the segment between Townsend Street and Folsom Street (which option is part of the locally preferred alternative)* would require demolition and removal of three such contributory buildings. Ten of the 13 buildings are contributors to the Rincon Point / South Beach Industrial Warehouse Historic District, which was identified as appearing eligible for the NRHP in 1983. The other three buildings are contributors to the Second and Howard Streets Historic District, which was determined eligible for the NRHP in 1999.

Pursuant to DOT Rules and Regulations Part 771.135 (g) (2), Section 4(f) does not apply to archaeological sites where the FTA, after consultation with the State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP), determines that the archaeological resource is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place, and data recovery is undertaken. On the basis of this qualification, Section 4(f) does not apply to any of the archaeological resources identified *in the project area. The Section 106 Historic Preservation Agreement in Appendix G details the actions that will be taken to recover the archaeological data present in the identified resources. Furthermore, the Agreement establishes procedures that will be followed during construction if an unanticipated discovery of archaeological resources occurs.*

## 8.2 PROJECT PURPOSE AND NEED

The *Transbay Joint Powers Authority,* City and County of San Francisco, Peninsula Corridor Joint Powers Board (JPB), and San Francisco Redevelopment Agency propose to construct a new multi-modal Transbay Terminal on the site of the present Transbay Terminal, extend Caltrain commuter rail service from its present northern terminus at Fourth and Townsend Streets in San Francisco to an underground terminus in the basement of a new Transbay Terminal, and establish a redevelopment area plan and related development projects, including transit-oriented development on publicly-owned land in the vicinity of the new terminal. The primary purposes of the project are to improve public access to bus and rail services, modernize the Transbay Terminal and improve its service, reduce non-transit vehicle usage, and revitalize the Transbay Terminal area. The project will also

address a number of related needs. It will improve Caltrain commute service by providing direct access to downtown San Francisco and enhance connectivity between Caltrain and other major transit systems. It will accommodate future intercity or high-speed rail services. The project is also expected to serve future travel demand in the San Jose - San Francisco corridor and alleviate traffic congestion on US Highway 101 and I-280 between San Jose and San Francisco as well as other routes; improve regional air quality; enhance accessibility to employment, retail and entertainment opportunities; and support local economic and land use development goals. More detailed discussion of the project purpose and need is provided in Chapter 1, Purpose of and Need for the Project.

## 8.3 PROJECT DESCRIPTION

The proposed project has three major components, as follows:

- A new, multi-modal Transbay Terminal on the site of the present Transbay Terminal;
- Extension of Caltrain commuter rail service from its current San Francisco terminus at Fourth and Townsend Streets to a new underground terminus underneath the proposed new Transbay Terminal; and
- Establishment of a Redevelopment Area Plan with related development projects, including transit-oriented development on publicly owned land in the vicinity of the new multi-modal Transbay Terminal.

Of various alternatives considered, two Transbay Terminal Alternatives, two Caltrain Downtown Extension Alternatives, and two Redevelopment Alternatives were carried forward into conceptual engineering and environmental studies. Both of the Caltrain Downtown Extension Alternatives include*d* design options. A brief description of these alternatives and options is provided in the following paragraphs; Chapter 2, Description of the Project Alternatives, describes these alternatives and options in detail.

### 8.3.1 TRANSBAY TERMINAL ALTERNATIVES

Two alternatives *were* studied for a new Transbay Terminal. Under either alternative, a new multi-modal terminal would be located at the site of the existing Transbay Terminal. Bus ramps would connect directly from the new terminal to the San Francisco-Oakland Bay Bridge, while a rail facility in the basement of the new terminal would provide space for the terminus of the Caltrain Downtown extension and for potential future East Bay commuter rail and California's high-speed intercity rail. The new terminal would provide facilities for AC Transit, Golden Gate Transit, Greyhound, and Muni buses and trolley coaches, paratransit, and for Greyhound Package Express and private taxi services. It would also include space for retail and cultural uses. It would incorporate sustainable design features to conserve energy and water resources.

#### 8.3.1.1 Transbay Terminal West Ramp Alternative *(Included in Locally Preferred Alternative)*

The Transbay Terminal West Ramp Alternative proposes to construct a terminal one block (165 feet) wide by three blocks (1,300 feet) long on the site of the existing Transbay Terminal, requiring demolition of the existing terminal and its loop ramp. The new Terminal would include six levels, with four levels above ground and two below, comprising an underground train level with a direct connection to the train platforms from the Transbay Terminal; an underground train mezzanine; a street level for bus services; an above-ground pedestrian concourse including 150,000 to 225,000 square feet of retail, entertainment, conference, educational, and cultural uses; and two above-ground bus decks. Elevators and escalators would provide for pedestrian circulation between levels. *This Transbay Terminal alternative has been identified for the terminal component of the Locally Preferred Alternative.*

Under this alternative, new direct bus ramps between the terminal and the Bay Bridge would be constructed on the west side of the terminal building in generally the same location as the existing ramps paralleling Essex Street. The existing loop ramp would be demolished and would not be rebuilt. Midday bus storage would be provided off-site under the west Bay Bridge approaches between Second and Fourth streets. Please see Section 2.2.1.1, Transbay Terminal West Ramp Alternative, for a detailed description of this alternative.

#### 8.3.1.2 Transbay Terminal Loop Ramp Alternative

The Transbay Terminal Loop Ramp Alternative proposes to construct a terminal one block (165 feet) wide and three blocks (1,300 feet) long on the site of the existing Transbay Terminal, requiring demolition of the existing terminal and its loop ramp. It would include five levels: an underground train level; an underground train mezzanine; a street level for bus services; an above-ground pedestrian concourse including entertainment, conference, educational, and cultural uses; and an above-ground bus level. Vertical pedestrian circulation would be provided as in the West Ramp Alternative.

The Loop Ramp Alternative would reconstruct both the west and east bus ramp structures, providing for a full one-way loop of bus circulation through the new Transbay Terminal, with direct connections to the Bay Bridge on both the east and west sides of the terminal building. The Loop Ramp Alternative would allow for some midday bus storage on the ramps, with the remaining storage off-site under the west Bay Bridge approaches. Please see Section 2.2.1.2, Transbay Terminal Loop Ramp Alternative, for a more detailed description of this alternative.

### 8.3.2 CALTRAIN DOWNTOWN EXTENSION ALTERNATIVES

The Caltrain Downtown Extension component of the project consists of an underground extension of Caltrain from its present San Francisco terminus at Fourth and Townsend Streets to a new

underground terminal at the site of the present Transbay Terminal at First and Mission Streets. The extension would consist of two to four tracks branching to several additional tracks into the basement of the proposed new Transbay Terminal. The extension would include new mainline tracks as they pass the Caltrain Fourth and Townsend storage yard, with a new subsurface station/platform near Fourth Street adjoining Townsend Street.

The extension alignment would enter a portal south of Townsend near Fifth Street, pass the new subsurface Fourth and Townsend platform, and continue eastward below grade under Townsend Street in a cut-and-cover tunnel configuration. It would then curve northward just east of Third Street in a cut-and-cover configuration to Second and Brannan Streets. The alignment would then continue in a cut-and-cover configuration under Second Street for about 2,055 feet.

#### 8.3.2.1 Caltrain Extension Tunneling Option *(Included in Locally Preferred Alternative)*

Use of tunneling rather than cut-and-cover is an option for the portion of the underground Caltrain Extension between Townsend Street and Folsom Street. A highly specialized tunneling technique known as the "stacked drift" approach is suitable to the fractured rock geology of this portion of the alignment. It involves very little risk of collapse and was evaluated specifically as an alternative to preserve many of the buildings under which the tunnel alignment would pass. Please see Sections 2.2.2.3 and 5.20 for more detail on this tunneling option, *which has been identified as the preferred option for tunneling this Caltrain Downtown Extension segment in the Locally Preferred Alternative.*

Two Caltrain Extension alignment alternatives are under consideration from Howard Street northward, both of which would be in a cut-and-cover configuration, as described in the following sections.

#### 8.3.2.2 Second-to-Main Caltrain Extension Alternative *(Included in Locally Preferred Alternative)*

As the Second-to-Main Caltrain Extension Alternative approaches Howard Street along Second Street, it would curve 90 degrees northeasterly, into the basement of the proposed new Transbay Terminal. It would have six tracks and three platforms within the Terminal building and would include approximately 2,000 feet of additional tracks in a cut-and-cover configuration from the east end of the new Terminal, curving 90 degrees south to Main Street, and continuing underneath Main Street to south of Folsom Street. This track could be used for temporary train storage and could be extended for a San Francisco-to-Oakland cross-bay alignment as a separate project. This alternative would include an option for an 800-foot-long pedestrian connection underneath Fremont Street to the BART Embarcadero Station. *The Second-to-Main Alternative has been identified as the Caltrain Extension component of the Locally Preferred Alternative.*

#### 8.3.2.3 Second-to-Mission Caltrain Extension Alternative

The Second-to-Mission Alternative would follow the same alignment as the Second-to-Main Alternative up Second Street to about Howard Street. As the alignment approaches Howard Street, rather than entering the terminal from the west and parallel to the axis of the terminal, it would curve northeasterly at about Tehama Street, cutting diagonally under what is known as the "hump" area in front of the present Transbay Terminal and would exit out Mission Street towards The Embarcadero. Two tracks would continue under Mission Street in a cut-and-cover configuration; these could be used for temporary train storage and could be extended for a San Francisco-to-Oakland cross-bay alignment as a separate project.

Please see Section 2.2.2, Caltrain Downtown Extension Alternative, for a more detailed description of this project component.

### 8.3.3 Redevelopment Alternatives

The third component of the project consists of establishment of a Redevelopment Plan Area and related development projects, including transit-oriented development on publicly owned land in the vicinity of the proposed new multi-modal Transbay Terminal. There are two alternatives to this component: a "full build" development scenario and a "reduced scope" development scenario.

#### 8.3.3.1 Full Build Development Scenario *(Included in Locally Preferred Alternative)*

The Full Build Alternative includes about 7.6 million square feet (sq. ft.) of new residential / office / retail / hotel development, including approximately 5.6 million sq. ft. (74 percent of the total development) of residential development (4,700 residential units including affordable housing); 1.2 million sq. ft. of office development; 475,000 sq. ft. of hotel development; and 355,000 sq. ft. of retail development. *This scenario has been identified for the redevelopment component of the Locally Preferred Alternative.*

#### 8.3.3.2 Reduced Scope Development Scenario

The Reduced Scope Alternative assumes a lesser amount of commercial and retail development and is weighted more toward housing. It assumes approximately 5.4 million sq. ft. of residential / office / retail / hotel development, including 4.7 million sq. ft. (87 percent of the total development) of residential development (3,900 dwelling units); 350,000 sq. ft. of hotel development; and 200,000 sq. ft. each of office and retail development.

### 8.3.4 The No-Project Alternative

The No-Project Alternative represents existing and committed (that is, funded) transportation services and facilities in the project corridor. The No-Project Alternative consists of existing

Caltrain service plus funded improvements and other committed bus, rail, and roadway improvements to the 2020 horizon year and a BART extension to the San Francisco International Airport.

### 8.3.5 ALTERNATIVES CONSIDERED AND WITHDRAWN

Other alternatives considered for the Transbay Terminal and Caltrain Extension project elements were withdrawn from further study because they would not accomplish the purpose and need for the project; would severely constrain railroad or bus operations; would constrain pedestrian circulation; would have severe community impacts; had extemely poor constructability; or would have involved extraordinary costs or substantial risk. These alternatives and the reasons why they were withdrawn from further consideration are described in Section 2.3, Alternatives Considered and Withdrawn. *None of these alternatives offered a feasible and prudent alternative for avoiding the use of Section 4(f)-protected resources.*

## 8.4 *DESCRIPTION OF* SECTION 4(F) PROPERTIES

Both Transbay Terminal alternatives and both Caltrain Downtown Extension alternatives would require the use of land from the Transbay Terminal property and demolition *and removal* of the Transbay Terminal building, which is eligible for the NRHP and is a contributing element to the San Francisco-Oakland Bay Bridge, *which is listed on the NRHP.* Both TransbayTerminal alternatives would also require demolition and removal of the existing terminal loop ramp *structures*, which *are* also contributing elements to the Bay Bridge.

Cut-and-cover tunnel construction for either Caltrain Downtown Extension alternative would require the use of land from and demolition of 13 buildings that are *either individually eligible or* eligible for listing in the NRHP as contributory elements to a district that is or appears eligible for listing. *These demolitions would result in the use of individual buildings in the district.*

The Tunnel Option for the Caltrain Downtown Extension alternatives would require the use of land from and demolition of three buildings that are eligible for listing in the NRHP as contributors to a district that is eligible for listing. *Demolition of these three buildings would also result in the use of individual buildings in the district.*

Both alternatives would also require a construction easement through the corner of a fourteenth property that is a contributor to an eligible district. This building would not be demolished, and the construction easement would not result in *its use under Section 4(f).*
*The following sections discuss each of these 4(f) properties. Maps showing their locations are provided in Figures 8.4-1 and 8.4.2* The Redevelopment Area component would not require the use of *Section* 4(f) property.

### 8.4.1 THE TRANSBAY TERMINAL

The Transbay Terminal at 425 Mission Street occupies land extending from Mission Street on the north to Natoma Street on the south; the terminal building crosses Fremont Street on the east and First Street on the west *(Figure 8.4-1 #1)*. It was designed by Timothy Pfleuger, Arthur Brown, Jr., and John J. Donovan, consulting architects. Built in 1939, the Transbay Terminal was the "functional successor to the Ferry Building. When electric trains began arriving over the Bay Bridge, use of the Ferry Building dropped to almost nothing overnight, and the Transbay Terminal took over as the primary gateway to the city." (Caltrans, 1983) The Terminal has been determined eligible for listing in the NRHP by consensus of the SHPO and a federal agency (FHWA) and is considered as a contributory element to the historic significance of the Bay Bridge. The present owner of the Transbay Terminal is Caltrans. Its current use is for commuter and inter- and intra-regional bus transportation.

### 8.4.2 THE TRANSBAY TERMINAL LOOP RAMP

The Transbay Terminal Loop Ramp *(Figure 8.4-1 #2)*, which leads from the Bay Bridge approaches to the Transbay Terminal, would be demolished to construct the new Transbay Terminal component of the project.

The Transbay Terminal loop ramp structure constitutes two of the six approach spans that remain from the original Bay Bridge project. *The loop ramp and approach spans are* contributing elements of the Bay Bridge. Originally designed to carry trolley trains from the bridge to the terminal, the ramp's tracks were removed when electrified trains gave way to buses in the late 1950s. The terminal loop ramp currently serves bus traffic exclusively and is used for midday storage of transit buses.

### 8.4.3 THE SAN FRANCISCO – OAKLAND BAY BRIDGE

The Bay Bridge *(Figure 8.4-1 #3)* is an eight and one-half mile long series of connecting structures carrying two levels of traffic between San Francisco and Oakland. Opened to service in 1936, in its original design, the bridge upper level carried two-way auto traffic while the lower level carried truck and trolley traffic. Structurally, the bridge is distinctive in its use of a variety of bridge-building technologies, the length of its 1,400-foot cantilever channel span on the east (Oakland) side, and the length of the two 2,320-foot suspension spans on the west (San Francisco) side.

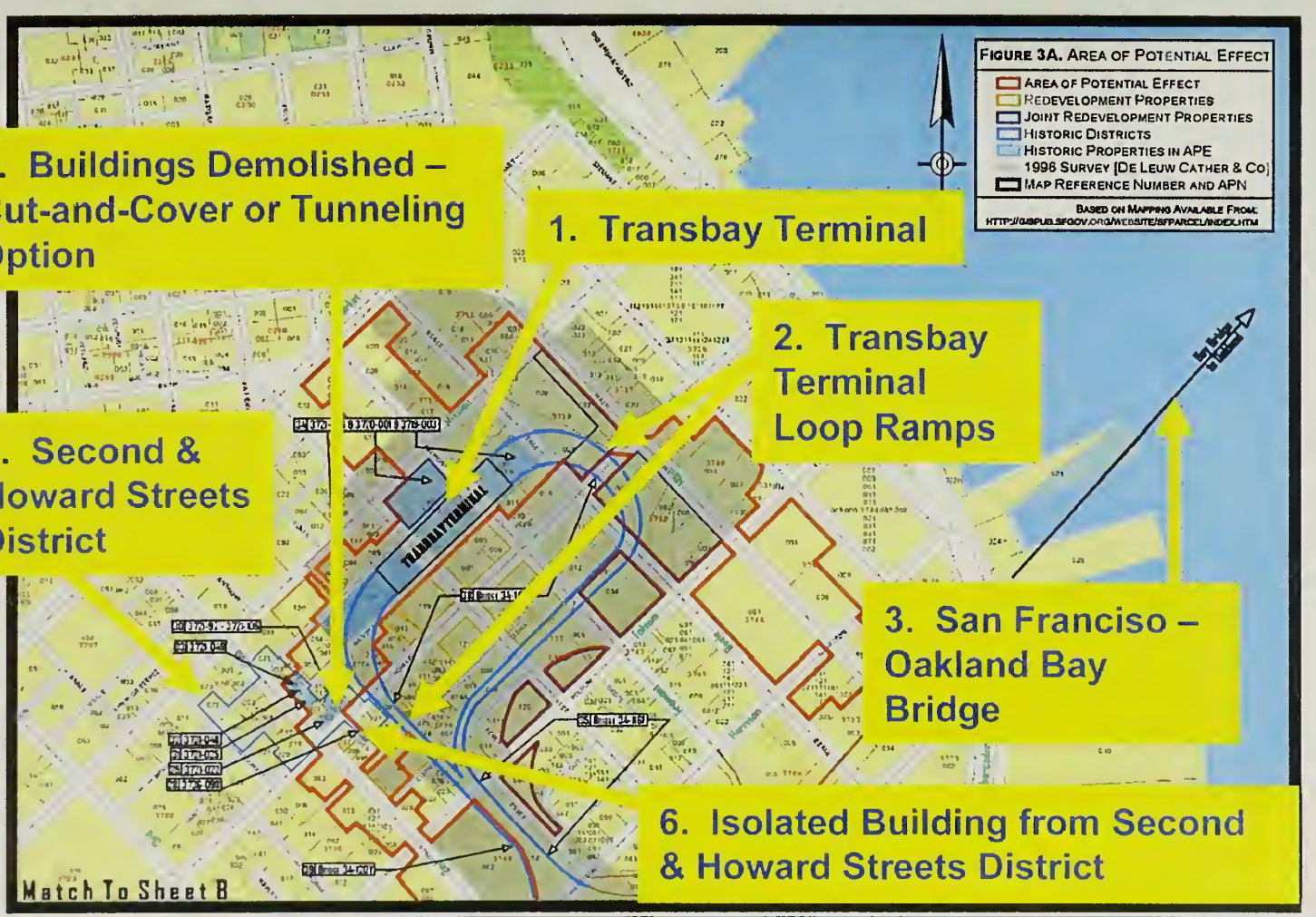



Figure 8.4-1: Section 4(f) Properties – Northern Portion

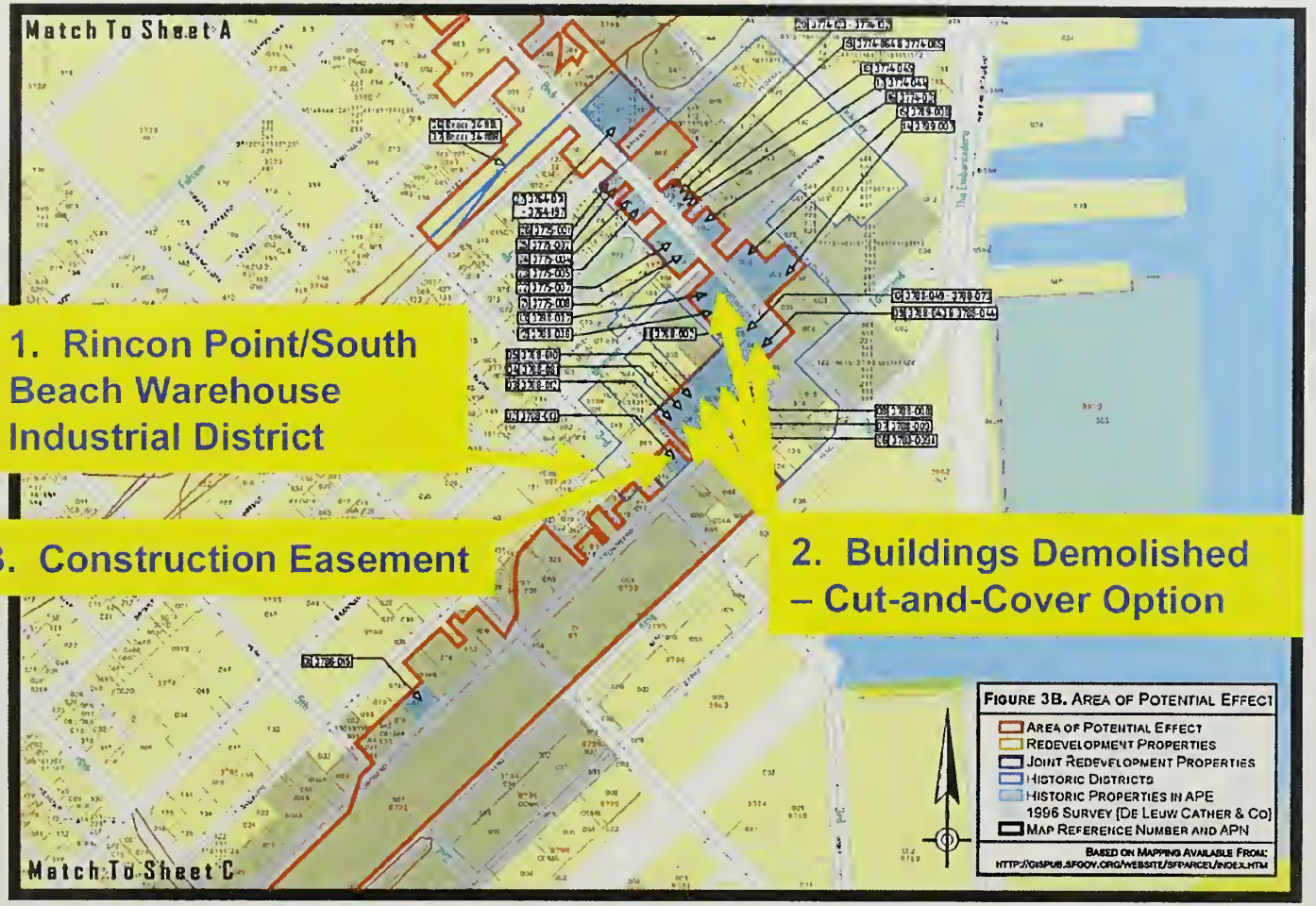



Figure 8.4-2: Section 4(f) Properties – Southern Portion

The outstanding engineering feature is the center pier between the two suspension spans of the western half of the bridge. The tunnel connections between the east and west spans on Yerba Buena Island was the first double-decked highway tunnel in the United States. Notable individuals connected wth the project were Charles H. Purcell, Chief Engineer; Charles E. Andrew, Bridge Engineer; Glenn B. Woodruff, Design Engineer; and T. L. Pfleuger, Arthur Brown, Jr., and John J. Donovan, consulting architects. The Bay Bridge was evaluated by Caltrans in 1983 as meeting National Register eligibility criteria A, B, and C at the national level; it was determined eligible for listing in 1985. *It was listed on the NRHP as a multi-component property on August 31, 2001.*

### 8.4.4 Rincon Point / South Beach Historic Warehouse-Industrial District

The Rincon Point / South Beach Historic Warehouse-Industrial District *(Figure 8.4-2 #1)* was identified and designated in the 1983 survey by Caltrans. It was developed beginning in the 1850s and 1860s, when landfill efforts and warehouse construction changed the physical appearance of the "point" and "beach" forever. This district contains the greatest concentration of architectural resources within the project vicinity. The district was identifed as appearing eligible for the NRHP in 1983, based on research completed by Caltrans historians for the I-280 Transfer Concept Project, but it was never determined eligible by the SHPO. That research found that the district appeared eligible under all four National Register criteria. About 60 buildings within the district have been identified as contributing to the district's significance. Approximately eight of these buildings date from before the 1906 San Francisco earthquake, with several from the mid-1800s.

The Rincon Point / South Beach Historic Warehouse Industrial District has also been designated locally significant and is eligible for listing in the California Register of Historic Places.

In 1985, the San Francisco Planning Department proposed the "South End Historic District," and the San Francisco Planning Commission designated this district under its landmarks program in February 1990. The South End Historic District has nearly identical boundaries and is nearly the same size as the Rincon Point District identified by Caltrans. The National Register status of the properties within the district, whether recognized as part of the South End district or Rincon Point / South Beach district, is the same. Please see Section 4.16.6, Historic Architectural Resources, for more detailed descriptions of both the NRHP and City of San Francisco districts.

### 8.4.5 Second and Howard Streets District

The Second and Howard Streets District *(Figure 8.4-1 #4)* was determined eligible for the NRHP in 1999. This small district consists of 19 contributing properties and three non-contributors (two heavily-altered buildings and a vacant lot) with addresses on Second, Howard, Natoma and Montgomery streets. The contributing buildings date from 1906 to 1912; the primary original uses of these buildings were wholesaling, light manufacturing, and printing. The area was built for services to the construction industry. The permit for the first building to be erected in the District was

approved on July 5, 1906, just two and a half months following the 1906 earthquake and fire. The Second and Howard Streets District is partially surrounded by a locally recognized district known as the "New Montgomery – Second Street Conservation District." The San Francisco Planning Commission uses the conservation district designation to recognize parts of the city that have substantial concentrations of "special architectural and aesthetic importance." Please see Section 4.16.6, Historical Architectural Resources, for more detailed descriptions of both the NRHP and City of San Francisco districts.

As many as *eighteen* historic buildings, including ten contributors to the Rincon Point / South Beach Industrial Warehouse District and *seven* contributors to the Second and Howard Streets District would be affected by the project. *The Locally Preferred Alternative including the Tunnel Option for the segment of the Caltrain Extension Alternative between Townsend Street and Folsom Street would affect seven contributors to the Second and Howard Streets District. The Locally Preferred Alternative would also require a construction easement through the corner of another property (the eighteenth property previously mentioned) that is a contributor to the Rincon Point / South Beach Industrial Warehouse District. This building would not be demolished, and the construction easement would not result in use of the building under Section 4(f).* The Transbay Terminal and ramps, which are contributors to the San Francisco-Oakland Bay Bridge, would be *demolished and removed.* Descriptions of each affected property are provided in Section 5.14, Historic and Cultural Resources.

Table 8.4-1 summarizes the impacts to the *Section* 4(f) properties that would be affected by the project, grouped in terms of the primary resources or districts to which they contribute.

## 8.5 USE OF SECTION 4(f) RESOURCES

Both *the* Transbay Terminal *West Ramp* Alternative *(the Locally Preferred Alternative) and the Transbay Terminal Loop Ramp Alternative* would require the *demolition and* removal of the Transbay Terminal *(Figure 8.4-1 #1)*, an NRHP-eligible resource and contributory element to the *San Francisco-Oakland* Bay Bridge, *a multi-component NRHP-listed property, and* of its existing ramp and bridge approaches, which are also contributing elements to the Bay Bridge. [1]

*1* In accordance with California Public Resources Code Section 5027, the Transbay Terminal and terminal loop ramp, as NRHP-eligible structures that would be transferred from state (Caltrans) ownership to another public agency (the Transbay Joint Powers Authority) may not be demolished without the prior approval of the California Legislature. The California Legislature has considered the importance of proceeding with the Transbay Transit Terminal project and has granted a specific exemption to State Law prohibiting the demolition of historic structures with the following language: "the Legislature hereby approves demolition of the Transbay Terminal building at First and Mission Streets in the City and County of San Francisco, including its associated ramps, for construction of a new terminal at the same location, designed to serve Caltrain in addition to local, regional, and intercity bus lines, and designed to accommodate high-speed passenger rail service." (AB 812, 2003)

**Table 8.4-1: *Section* 4(f) Properties That Would be *Used* by the Transbay Terminal and Caltrain Downtown Extension Component Alternatives**

| Property Descriptor | NRHP Status | Use | |
|---|---|---|---|
| | | *Cut-and-Cover Trench* | *Stacked Drift Tunneling [1]* |
| ***San Francisco-Oakland Bay Bridge, a multi-component property listed on the NRHP*** | | | |
| Transbay Terminal, 425 Mission Street | Individually eligible & contributor | Demolition | Demolition |
| Bay Bridge Approaches | Contributor | Demolition | Demolition |
| Bus Ramps | Contributor | Demolition | Demolition |
| ***Second and Howard Streets District***[2] | | | |
| 165-173 Second Street | Contributor | Demolition | Demolition |
| 191 Second Street | Contributor | Demolition | Demolition |
| 580-586 Howard Street | Contributor | Demolition | Demolition |
| *163 Second Street* | *Contributor* | *Adverse effect due to loss of nearby contributing building* | *Adverse effect due to loss of nearby contributing building* |
| *577-79 Howard Street* | *Contributor* | *Isolated from District* | *Isolated from District* |
| *583-87 Howard Street* | *Contributor* | *Isolated from District* | *Isolated from District* |
| *589-591 Howard Street* | *Contributor* | *Isolated from District* | *Isolated from District* |
| *Entire District Second and Howard Street District* | *Eligible* | *Use of District* | *Use of District* |
| ***Rincon Point/South Beach Industrial Warehouse District*** | | | |
| 35 Stanford Street | Contributor | Demolition | No use |
| 640 Second Street | Contributor | Demolition | No use |
| 650 Second Street | Contributor | Demolition | No use |
| 670-680 Second Street | Contributor | Demolition | No use |
| 301-327 Brannan Street | Contributor | Demolition | No use |
| 130 Townsend Street | Contributor | Demolition | No use |
| 136 Townsend Street | Contributor | Demolition | No use |
| 144-46 Townsend Street | Contributor | Demolition | No use |
| 148-54 Townsend Street | Contributor | Demolition | No use |
| 162-164 Townsend Street | Contributor | Demolition | No use |
| 166-78 Townsend Street | Contributor | Construction Easement/ Temporary Occupancy/ No use | Construction Easement/ Temporary Occupancy/ No use |
| *Entire Rincon Point/South Beach Industrial Warehouse District* | *Eligible* | *Use of District* | *No Use of District* |

[1] The tunneling option has been identified as the Caltrain Extension component of the Locally Preferred Alternative (LPA).

[2] *The buildings at 577-79 Howard Street and 583-87 Howard Street are outside the APE but are contributing elements to the National Register District.*

The Tunneling Option *(identified for the Caltrain Extension component of the Locally Preferred Alternative)* would require the removal of three historic buildings *(Figure 8.4-1 #5) and result in the isolation from the remainder of the district of three other buildings (Figure 8.4.1 #6),* all of which are contributors to the Second and Howard Historic District. These impacts would result in *a use of these individual buildings and the District* under Section 4(f). Under this tunneling option, the 10 buildings that are contributors to the Rincon Point / South Beach District would be retained and would be underpinned to protect them from harm during construction. There would thus be *no use of* these properties *or the District* with this construction option. The stacked drift tunneling method has an extremely low likelihood of collapse or tunnel failure. *Reducing impacts to historic properties was a primary factor in the identification of the tunneling option for the Townsend Street to Folsom Street segment of the Caltrain Extension component of the Locally Preferred Alternative.*

A construction easement through an *eighteenth* property (affecting the southeast corner of the 166-178 Townsend property, *Figure 8.4-2 #3*) would also be required to construct the subway for the Caltrain Downtown Extension under either construction option. The California Electric Light Company building would not be removed and would be underpinned to protect it from harm during construction. The easement would not constitute use under Section 4(f) pursuant to 23 CFR 771.135 (7). The occupancy of land from the affected *Section* 4(f) property would be temporary, and less than the time needed for construction of the project. The encroachment would be for a construction easement only; there would be no change in ownership of the land. The scope of the work would be minor and there would be no changes to the nature or magnitude of the *Section* 4(f) resource; the building would be unchanged. Not only would there be no adverse physical impact, but there would be no interference with the purposes of the *Section* 4(f) resource, which would remain in place during construction. The resource would remain a contributor to its historic district. Following construction of the tunnel, the property would be returned to its original condition.

*The demolitions of the Transbay Terminal and ramp structures, demolition of three historic buildings that are contributors to a historic district, and isolation of three other buildings from the remainder of the district that would occur under the Locally Preferred Alternative would constitute a use of these historic buildings and the Second and Howard District under Section 4(f). The construction easement required for the building at 166-178 Townsend will not result in a use under Section 4(f).*

## 8.6 AVOIDANCE ALTERNATIVES

Two alternatives were evaluated for each project component to achieve the project purpose and need. Also, the Caltrain Extension component has two construction Options. There are differences in effects on *Section* 4(f)-protected resources among these Alternatives and Options, as discussed in the following section, which is organized by project component. The No-Project Alternative is also briefly discussed.

### 8.6.1 TRANSBAY TERMINAL COMPONENT

There are no Transbay Terminal alternatives that are either reasonable, or feasible and prudent, and that avoid *Section* 4(f)-protected resources, as shown in the following paragraphs.

#### 8.6.1.1 Transbay Terminal Alternatives Considered in the Present Document

*The purpose and need for the Project includes the extension of Caltrain to the site of the existing Transbay Terminal in the Financial/South of Market downtown area (as required by Proposition H), as well as the ability to accommodate a California high-speed system (as also required by Proposition H). This Project's purpose and need could not be achieved by rehabilitation of the present Transbay Terminal.*

*Bringing the Caltrain/high speed rail tracks into the upper levels of the present terminal would displace portion of the current AC Transit operations, would require retrofitting the terminal, (substantially reducing its ability to function effectively), and would disrupt current transit operations. It would also require new elevated train tracks leading to the terminal, thus reducing the ability of redevelopment planning efforts to revitalize the area around the terminal.*

*Additionally, such retrofit would require bringing the remainder of the present facility up to building codes and ADA requirements, adding additional cost and disruption to the present terminal operation; and terminal retrofit would require continued use of the eastern bus ramp (which would not occur under the selected Locally Preferred Alternative West Ramp Alternative), thus reducing the ability of the proposed redevelopment planning to revitalize the area surrounding the terminal. Bringing the Caltrain extension and high speed rail tracks into the basement of the present terminal is not practicable.*

*Finally, it should be noted that the Metropolitan Transportation Commission's Transbay Terminal Study generated a regional consensus among the participating agencies (Caltrans, AC Transit, Golden Gate Transit District, Muni, the City and County of San Francisco, the Peninsula Corridor Joint Power Board, and SamTrans) for a new terminal on the site of the current Transbay Terminal.*

*To meet the purpose and need of the Project,* it would be necessary to demolish the existing Transbay Terminal and the terminal loop ramp, both of which are *Section* 4(f)-protected resources.

#### 8.6.1.2 Transbay Terminal at Main/Beale

The New Bus Terminal at the Main/Beale Site that was considered in the 1997 Draft EIS/EIR for the Caltrain Downtown Extension would not have constructed a new terminal at the site of the present Transbay Terminal but it would not have avoided removal of the existing Transbay Terminal and terminal loop ramp. Although this option would have placed bus operations at the Main/Beale site, the Caltrain Downtown Extension was still proposed to terminate underground at the site of the present Transbay Terminal, which required demolition and removal of the terminal and terminal loop ramp. Note that this bus terminal alternative had been endorsed by the San Francisco Board of

Supervisors but was ultimately found not to be feasible because the Main/Beale site could not provide for the needed level of AC Transit service. Withdrawal of the Main/Beale site was also consistent with the provisions of Proposition H (passed by the voters of San Francisco in November, 1998), which called for a multi-modal facility on the site of the current Transbay Terminal.

### 8.6.2 CALTRAIN DOWNTOWN EXTENSION COMPONENT

Two Alternatives with different horizontal and vertical alignment geometrics and two construction approaches (cut-and-cover *trenching* and tunneling) were evaluated to meet the project purpose and need for the Caltrain Downtown Extension. There would be no difference in effects to *Section* 4(f)-protected resources between the Second–to-Mission Street and Second-to-Main Street Alternatives if constructed using the cut-and-cover trenching technique, however, construction of these alternatives using the Tunneling Option would affect fewer Section 4(f) protected properties, *as discussed in the following paragraphs. There was no feasible and prudent Caltrain Downtown Extension Alternative that would avoid all historic properties.*

#### 8.6.2.1 Cut-and-Cover Tunneling Option

The Cut-and-Cover Option would require the removal of all 13 historic buildings described in Section 8.4, Potentially Affected Section 4(f) Properties. Ten of these buildings are contributors to the Rincon Point / South Beach Industrial Warehouse District and three are contributors to the Second and Howard Historic District. *Removal of ten buildings from the Rincon Point / South Beach Industrial Warehouse District would result in a use of that district under Section 4(f) Removal of the three contributors to the Second and Howard Historic District would result in a use of the Second and Howard District through isolation of three other buildings from the remainder of the district.* The Cut-and-Cover Option would also require *a* construction easement through the southeast corner of the 166-178 Townsend property, which is a contributor to the Rincon Point historic district; *this easement would be temporary and would not require alteration or demolition of the building, and therefore would not constitute a use of the property.*

#### 8.6.2.2 Stacked Drift Tunneling Option

The Tunneling Option would avoid removal of 10 historic buildings that are contributors to the Rincon Point / South Beach Industrial Warehouse District, but would require removal of three buildings that are contributors to the Second and Howard Historic District, *resulting in a use of those buildings under Section 4(f). Removal of these three buildings would also result in the isolation of three other buildings from the remainder of the district, resulting in a use of that District. The Tunneling Option constitutes an avoidance alternative for the 10 historic buildings that are contributors to the Rincon Point District. Reducing impacts to historic buildings and districts consistent with the requirements of Section 4(f) was a primary factor in the identification of the Tunneling Option for the Caltrain Downtown Extension component of the Locally Preferred Alternative.*

*The inability to successfully tunnel under the three historic structures in the Second and Howard District is due to ground conditions and the necessary Project facilities for this immediate area. A large number of closely spaced tracks are required for the segment leading from Folsom Street into the new Terminal. This is the areas where the tracks leading north on Second Street would need to brand into six tracks leading into the basement of the terminal. Soils near Second and Howard Streets are exceptionally soft and weak, and the excavations required for the multiple, closely spaced tracks would be wide. While it may be technically feasible to construct a single tunnel or perhaps twin bores under a given building, it is not considered practicable in the soft soils to open so many tunnels so close to each to accommodate the multiple tracks.*

The Tunneling Option would also require *the same* construction easement through the southeast corner of the 166-178 Townsend property, which is a contributor to the Rincon Point historic district, *but this easement would be temporary and would not require alteration or demolition of the building, and therefore would not constitute a use of the property.*

### 8.6.2.3 Caltrain Downtown Extension – Essex Street Stub-End Alignment Alternative

In response to the curve radii problems associated with the 1997 Caltrain Downtown Extension alignment, an alternate subway alignment was reviewed that did not curve into the basement of the proposed new Transbay Terminal, but included a train terminal oriented perpendicular to and west of the existing Terminal. Therefore, it did not require demolition of the existing Transbay Terminal. Also, it would have been possible to construct this alignment using the stacked drift technique. This would have avoided demolition of all of the historic buildings in and around the Rincon Point / South Beach Industrial Warehouse District, while the alignment would not have encroached into the Second and Howard Historic District.

This alternative was included in the Notice of Preparation and Notice of Intent to Prepare this EIS/EIR, but was found not to be feasible. During the scoping process, the public noted several shortcomings of this alignment, and these public comments and shortcomings contributed to the withdrawal of this alternative alignment from further consideration. Because the train platforms would not have been directly under the new multi-modal transit facility, internal passenger circulation and transfers between modes would have been substantially compromised. Also, the stub-end orientation meant that trains would not be able to enter one end of the station and exit at the other. In the stub-end configuration, trains would pull into the station and would need to reverse direction to exit. This would substantially impair operating efficiency and would not meet the project purpose to improve Caltrain service to downtown San Francisco.

While it would have been possible to construct the Essex Street Stub-End Alignment of the Caltrain Downtown Extension without demolishing and erecting a new Transbay Terminal, this action would not have been a reasonable undertaking. Leaving the existing Transbay Terminal in place would have done nothing to improve space utilization, passenger circulation, signage, safety or operating efficiency within the existing Transbay Terminal. There would have been very limited potential for revenue-generating joint development within the terminal or its environs. The existing terminal footprint includes numerous structures crossing city streets, a condition that has contributed to the

continued deterioration and underutilization of land in the surrounding area. None of these conditions would have been improved without demolition of the terminal under this alternative.

In summary, therefore, this alternative alignment was found not to be feasible or reasonable and it was withdrawn from further consideration. It therefore does not constitute an avoidance alternative under Section 4(f).

### 8.6.3 No-Project Alternative

The No-Project Alternative would not use the Transbay Terminal or the existing loop ramp *approach structures*, but this alternative would not address the Project's purpose and need. Note, however, that Caltrans is currently completing seismic retrofit of the loop ramp, and Caltrans' plans include demolition and removal of the east ramps and reconstruction of the west ramps. Further, the existing Transbay Terminal building also requires substantial and costly retrofit and reconstruction to meet current seismic and other building codes. Interim retrofit measures have been taken, but the full reconstruction (to be undertaken by others) may be so extensive as to result in the use of the resource under Section 4(f). Given the high costs of retrofitting the existing terminal, the City of San Francisco requested Caltrans cooperation in considering replacement alternatives that would meet the project purposes identified for the present study.

### 8.6.4 Other Alternatives

Other alternatives and alignment variations considered for the 1997 Draft EIS/EIR for the Caltrain Downtown Extension were not feasible or prudent for the present study. Geometrics for these alignment alternatives did not meet curve radius minimums required to accommodate high-speed steel-wheel-on-rail equipment currently in use in Europe and under consideration by the California High-Speed Rail Authority for implementation in California, including a station in downtown San Francisco. Constructing a new Caltrain alignment that precluded future use by high-speed rail equipment was not prudent, and these alternatives were withdrawn from further consideration.

Figures 2.2-1, 2.2-5 through 2.2-7, and 2.2-9 though 21 show the project alternatives. Figure 2.3-1 shows all of the alternatives for the terminal and extension components that were considered in the present study and the 1997 Draft EIS/EIR but found not to be viable.

## 8.7 MEASURES TO MINIMIZE HARM

There are no remaining *feasible and prudent* alternatives that avoid *Section* 4(f)-protected properties. The *Locally Preferred Alternative comprising the Transbay Terminal West Ramp, Caltrain Downtown Extension with Tunneling Option for the Townsend Street to Folsom Street segment /*

*Second-to-Main Alignment Alternative and Full Build Development Scenario* would include all possible planning to minimize harm to the properties.

*Measures to minimize harm are included in a Memorandum of Agreement (MOA). Signatory parties to the MOA include FTA and SHPO. The City and County of San Francisco, the Transbay Terminal Joint Powers Authority (TJPA), the Peninsula Corridor Joint Powers Board (JPB), and Caltrans are invited concurring parties to the MOA. The MOA is included in Appendix G of this Final EIS/EIR. The Measures are summarized below.*

1. ***Professional Standards**: All activities regarding history, historic preservation, historical archaeology and prehistoric archaeology that are carried out will be carried out by or under the direct supervision of persons meeting, at a minimum, the Secretary of the Interior's professional qualifications standards (48 FR 44738-9) in these disciplines.*

2. ***Mitigation of Effects on Components of the San Francisco-Oakland Bay Bridge (Bay Bridge)***

   A. ***Permanent Interpretive Exhibit at the Terminal**: TJPA will direct the design and engineering team for the Undertaking to integrate into the design of the new terminal a dedicated space for a permanent interpretive exhibit. TJPA will also consult with the City of Oakland about its interest in having a similar interpretive exhibit in the East Bay.*

   B. ***Salvage:** TJPA, in consultation with the State Department of Transportation (Department), will identify elements of the existing Transbay Transit Terminal that are suitable for salvage and interpretive use in the exhibit in the new Terminal or in museums.*

   C. ***Oakland Museum of California Exhibit:** TJPA will consult with Department and the Oakland Museum about contributing to Department's exhibit at the Oakland Museum relating to the history and engineering of the major historic state bridges of the San Francisco Bay Area.*

   D. ***Documentation:** TJPA will consult with the California SHPO to ensure that the Transbay Transit Terminal has been adequately recorded by past efforts. TJPA will ensure that these records are accepted by SHPO prior to demolition of the Transbay Transit Terminal.*

   E. ***Reevaluation of the Bay Bridge** by the TJPA will occur within 180 days after FTA determines that the Undertaking has been completed.*

3. ***Mitigation of Effects on Second and Howard Streets Historic District and Protective Measures for Rincon Point/South Beach Historic Warehouse Industrial District***

   A. ***Protective Measures:*** *TJPA, in consultation with the owners of historic properties immediately adjoining the construction sites, will develop and implement measures to protect the contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District from damage by any aspect of the Undertaking.*

   B. ***HABS/HAER Documentation:*** *TJPA will assure that the three historic properties in the Second and Howard District to be demolished will be recorded in accordance with HABS/HAER standards, as appropriate.*

   C. ***Repair of Inadvertent Damage:*** *TJPA will ensure that any damage to contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District resulting from the Undertaking will be repaired in accordance with the Secretary of the Interior's Standards for Rehabilitation.*

   D. ***Reevaluation of the Second and Howard Streets Historic District by the TJPA*** *will occur within 180 days after FTA determines that the Undertaking has been completed,*

4. ***As described in Chapter 5 of this Final EIS/EIR, directly relevant mitigation measures include:***

   - *Provision of signage during construction.*
   - *Installation of a level deck for cut-and-cover construction*
   - *Provision of efficient sidewalk design and maintenance.*
   - *Underpinning of existing buildings, where deemed necessary, to protect existing structures from potential damage that could result from excessive ground movements during construction. Other alternatives, in lieu of underpinning, involve strengthening of the rock between the building and the crown of the tunnel. Grouting in combination with inclined pin piles can be used not only to strengthen the rock but to make the rock mass over the tunnel act as a rigid beam, which would allow construction of the tunnels with no adverse effects on the buildings that are supported on shallow foundations over the tunnel.*
   - *Proper design and construction of pile supported foundations for structures to control potential settlement of the surface.*
   - *Upon completion of the construction phase, power wash and/or paint buildings with visible signs of dirt and debris from the construction site (given that permission is obtained from the property owner to gain access to and wash the property with no fee charged by the owner).*
   - *Limit or prohibit use of construction techniques that create high vibration levels.*

- *Restrict procedures that contractors can use in vibration sensitive areas.*
- *Require vibration monitoring during vibration intensive activities.*
- *Restrict the hours of vibration intensive activities such as pile driving to weekdays during daytime hours.*
- *Investigate alternative construction methods and practices to reduce the impacts in coordination with the construction contractor if resident annoyance from vibration becomes a problem.*
- *Include specific limits, practices and monitoring and reporting procedures for the use of controlled detonation.*
- *Use high-resilience track fasteners or a resiliently supported tie system for the Caltrain downtown extension for areas projected to exceed vibration criteria.*
- *Require the project contractors to ensure that construction crews working at night direct any artificial lighting onto the work site in order to minimize "spill over" light or glare effects on adjacent areas.*
- *Ensure that any damage to contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District resulting from the Undertaking will be repaired in accordance with the Secretary of the Interior's Standards for Rehabilitation.*

## *8.8 COORDINATION WITH DEPARTMENT OF INTERIOR*

*The United States Department of Interior (DOI) provided the following comments regarding Section 4(f) matters related to the proposed Project in a letter from Willie R. Taylor, Director, Office of Environmental Policy and Compliance, Office of the Secretary, DOI, to Leslie Rogers, Region IX Administrator, FTA. (The DOI letter dated March 9, 2004 is contained in Appendix D.) The DOI comments and responses to those comments are provided in Table 8.8-1.*

| *Table 8.8-1: Responses to the Department of Interior (National Park Service) Comments* | |
|---|---|
| ***Department of Interior Comment*** | ***Response to Comment*** |
| *Based on the information provided in the EIS/Report, it is apparent that no public parkland, refuge, or similar site would be affected by either of the action alternatives. Therefore, there are no Section 4(f) considerations with regard to recreational sites.* | *Section 4.4 of this Final EIS/EIR, Volume I shows that there would be no impacts to public parklands, refuges, or similar sites.* |
| *The National Park Service's Pacific West Regional Office has reviewed this administrative draft document identifying and analyzing a "no action" alternative as well as "action" alternatives for individual components of the proposed project. A locally preferred Stacked Drift Tunneling West Ramp alternative is also deemed to be the environmentally superior alternative.* | *The DOI reviewed the administrative draft Final EIS/EIR that identified the Locally Preferred Alternative (LPA) as the Stacked Drift Tunneling West Ramp alternative. This LPA is described in Section 2.2 of this Final EIS/EIR, Volume I.* |
| *In regard to cultural resources, each of the "action" alternatives entails demolition of historic buildings. The locally preferred alternative would have significantly less impact on other listed historic structures in comparison with the Cut and Cover Trench/West Ramp alternative.* | *As described in Sections 5.14 and 8.6.2 of this Final EIS/EIR, Volume I, the LPA would have significantly less impact on listed historic structures.* |
| *Several options were withdrawn from full analysis because they would fall short of meeting the expressed purpose and need for action. None of the withdrawn options offered a feasible and prudent alternative for avoiding the identified effects on cultural resources.* | *Alternative considered and withdrawn from consideration and reasons for their withdrawal are described in Sections 2.3 and Section 8.6 of this Final EIS/EIR, Volume I.* |
| *The locally preferred Stacked Drift alternative slates six historic structures for demolition. Three of the resources slated for demolition – Transbay Terminal (425 Mission Street), Bay Bridge Approaches, and Bus Ramps – have been designated contributing resources to the San Francisco-Oakland Bay Bridge, a multi-* | *These impacts associated with the LPA are described in Sections 5.14, 8.5 and 8.6 of this Final EIS/EIR, Volume I. The MOA for this Project is contained in Appendix G of this Final EIS/EIR, Volume I.* |

***Table 8.8-1: Responses to the Department of Interior (National Park Service) Comments***

| ***Department of Interior Comment*** | ***Response to Comment*** |
|---|---|
| *component property listed on the National Register of Historic Places (NRHP). According to the draft Memorandum of Agreement (MOA) included in the EIS/Report, the California Legislature has granted a specific exemption to State law prohibiting the demolition of historic structures as follows:*<br><br>*"The Legislature thereby approves demolition of the Transbay Terminal building at First & Mission Streets in the City and County of San Francisco, including the associated ramps, for construction of a new terminal at the same location..." (AB 812, 2003).* | |
| *Our concerns are twofold. First, three of the structures slated for demolition (and not addressed by AB 812) – 165-173 Second Street, 191 Second Street, 580-586 Howard Street – have been designated as contributing resources in the Second & Howard Streets District. Demolition of these three structures in the Second & Howard Streets District also result in isolation of four additional contributing resources in the District, adding to the adverse impact of the undertaking on the integrity of the District. While it is clear that the proposed undertaking will adversely affect all six properties, not enough information has been provided in the EIS/Report materials to determine the overall effect of the proposed demolition on the integrity of the Second & Howard Streets District or the Bay Bridge District (as listed on the NRHP).*<br><br>*Second, the MOA Section III (F) stipulates that a reevaluation of the Bay Bridge District shall occur within 180 days of completion of the undertaking to determine whether the nomination should be amended or whether the bridge no longer qualifies for listing and should* | *In response to DOI's request, the MOA (Appendix G) now includes a reevaluation clause not only for the Bay Bridge (MOA, Section III.E) but also for the Second and Howard Street District (MOA, Section IV.D.). Additional information has been added to Section 5.14 of the administrative draft Final EIS/EIR (shown as underlined and italics on pages 5-90, 5-91, 5-103, and 5-104 of this Final EIS/EIR) stating that it is not anticipated that the Undertaking would result in a delisting from the NRHP of the remaining elements for either of these resources. Underlying reasons are provided.*<br><br>*The number of isolated buildings shown in the* ***administrative draft*** *Final EIS/EIR (as reviewed by the DOI) has been changed from four to three for this Final EIS/EIR. Specifically, 163 Second Street would not be isolated but rather would be adversely affected due to loss of a nearby contributing building.* |

*Table 8.8-1: Responses to the Department of Interior (National Park Service) Comments*

| *Department of Interior Comment* | *Response to Comment* |
|---|---|
| *be removed from the NRHP. The MOA states that the Transbay Joint Powers Administration will conduct the evaluation in consultation with the SHPO. A similar clause is not included for the Second & Howard Street Historic District in the Mitigation Section IV of the MOA. From the information provided, it is unclear whether an evaluation was completed to assess the potential impact of the proposed undertaking on the Second & Howard Street Historic District, or if not, what was the basis for this result. If an evaluation has not been done, our recommendation would be to complete this process for the Second & Howard Street District.* | |
| *The Department of the Interior has no objection to Section 4(f) approval of this project, provided the measures to minimize harm mentioned above are included in the project plans and implementation.*<br><br>*Because this Department has a continuing interest in this project, we are willing to cooperate and coordinate with you on a technical assistance basis in further project evaluation and assessment.* | *As shown above, the requested measures to minimize harm in the DOI letter are included in the Project plans and implementation. Given DOI's letter stating no objection with these measures in place, FTA has determined that there is no feasible and prudent alternative to the use of land from the national register properties required for the LPA and that implementation of the proposed LPA includes all possible planning to minimize harm resulting from such use (see Section 8.9 below).* |

## 8.9 SECTION 4(f) FINDING

*It is determined that there is no feasible and prudent alternative to the use of land from the national register properties required for the Locally Preferred Alternative (LPA) and that implementation of the proposed LPA includes all possible planning to minimize harm resulting from such use.*

*Underlying reasons for these findings include:*

- *The regional designation of the Transbay Terminal site as the appropriate site for a new regional multi-modal terminal,*
- *The requirement for and advantages of providing new bus ramps to the new terminal (i.e., elimination of the east loop, stacking of the west ramps),*
- *The need to provide commuter and high-speed train service into the basement of this new facility to enhance regional transit connectivity,*
- *The major advantages (i.e., reduced community impacts and project costs) of using public rights-of-way (Townsend and Second Streets) for the underground train extension, and the minimum curve radii required for high speed trains,*
- *The soft ground conditions and multiple, closely-spaced tunnel requirements in the Second and Howard Streets area,*
- *The selection of a Locally Preferred alternative minimizing the number of 4(f) resources used, and*
- *The agreement to document and preserve elements of the 4(f) resources via recordation, displays in the new terminal and at local museums, financial participation in the production in educational videos, and the salvage of appropriate elements in the terminal.*

# APPENDIX A: FINAL EIS/EIR DISTRIBUTION LIST

## Agencies/Businesses/Associations/Individual Receiving Volumes I and II of the Final EIS/EIR

### Federal Agencies

Advisory Council on Historic Preservation
Department of Commerce, National Oceanic and Atmospheric Administration
Department of Health and Human Services
Department of Housing and Urban Development
Environmental Protection Agency
Federal Emergency Management Agency
Federal Railroad Administration
Surface Transportation Board
U.S. Fish and Wildlife Service
U.S. Department of Energy
U.S. Department of Interior, Office of Environmental Policy & Compliance
U.S. Department of Interior, National Park Service

### State Agencies

Business, Transportation & Housing Agency
California Air Resources Board
California Department of Fish & Game
California Department of Toxic Substances Control
California Department of Transportation (Caltrans) District 4
California High-Speed Rail Authority
California Integrated Waste Management Board
California Public Utilities Commission
California Transportation Commission
Native American Heritage Commission
Northwestern Information Center
Office of Historic Preservation, California Department of Parks & Recreation
Regional Water Quality Control Board, San Francisco Bay Region
San Francisco Bay Conservation & Development
State Clearinghouse, State Office of Intergovernmental Management
State Department of Housing & Community Development
State Resources Agency

### Elected Officials

San Francisco State Assembly Members
San Francisco State Senate Members
San Francisco Mayor
San Francisco Board of Supervisors
U.S. Senator Dianne Feinstein
U.S. Senator Barbara Boxer
U.S. Congressmember Nancy Pelosi

### Regional Agencies

Association of Bay Area Governments
Bay Area Air Quality Management District
Metropolitan Transportation Commission

### County Agencies

City/County Association of Governments – San Mateo County

### City and County of San Francisco Agencies

San Francisco Planning Commission
San Francisco Municipal Railway
San Francisco Department of Parking and Traffic

San Francisco Planning Department
San Francisco County Transportation Authority

**Public Libraries**

City of Berkeley Central Library, 2090 Kittredge Street (at Shattuck)
Main libraries, Cities along Caltrain Corridor
San Francisco Central Library, 100 Larkin Street (at Grove)

**Public Transit Operators**

AC Transit
Bay Area Rapid Transit District
Golden Gate Bridge, Highway, and Transportation District
San Mateo County Transit District
Santa Clara Valley Transit Authority

**Media**

San Francisco Chronicle
San Francisco Bay Guardian
San Francisco Business Times

**Community Groups and Organizations**

BayRail Alliance
League of Women Voters of the Bay Area
League of Women Voters of San Francisco
Regional Alliance for Transit
Rescue Muni
San Franciscans for Reasonable Growth
San Francisco Architectural Heritage
San Francisco Bicycle Coalition (SFBC)
San Francisco Planning and Urban Research
San Francisco Tomorrow
Transbay Alliance
Train Rider's Association of California
Transportation Solutions Defense & Education Fund (TRANSDEF)

**Individuals**

Michael Alfaro
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William Blackwell
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Andrew Littlefield
Yevgeniy Lysyy
Francis Mathews
Jan Johnston Mathews
Mary McDonald
Arthur L. Meader III
Mary Anne Miller
Susan Miller
Patrick Moore
Matthew Morrison
Patrick Moyroud
James M. Patrick
Greg Patterson
Ted Pollak

Norman Rolfe
Michael Rothenberg
Peter Sheerin
Andrew Sullivan
Tay C. Via
Art Wagner
Frances Wong
George Yamas
Chadowitz
Gerald Adams
Sue Hestor
Mrs. G. Bland Platt
James Reuben
John Sanger, Esq.
Steven Vettel

**Potentially Affected Property Owners**

171 Second Street LLC @ Union Property Capital Inc.
Abbassi 1988 Living Trust % Michael & Kathryn Abbassi
Bank of America NA % Eric Forsberg
Beck William U Revoc Trust % Willam U Beck
Birmingham Robert @ 201 Second Street LLC
Byer Allan G & Marian-Bam P
Peter F.Byrne
Peggy J. Field Survivors Trust % Custom Paper Products
Fritzi, Realty-Owner
Howard Historic Properties % Patrick McNerney
Jaron Partners
John L. & Carol Gasparini
Adolph & Marion V Gasser Rev
John Gasser @ Adolph Gasser, Inc.
Anthony M. Hay
Helsten Partners LLP % Norm Weil
Invesmaster Corporation
Joe Korich
KSW Properties
Martin Propertries LLC % Patrick McNerney
McNerney Patrick M.
McNerney Wendy L. Roess
Melanson Gregory & Susan
Mission Street Development LLC
Morosi 1991 Trust Donald J % Pamela M Deferrari
Jack Myers Myers Development Co.
Nextel of CA % Helsten Partners LP
Northshore Resources I Ltd
Patrick & Company
Pelichoff Scott Eric & Lynn
Pelichoff Scott & Lynn
Prudential Insurance Co. % Dean Pappas, O'Melveny & Meyesrs LLP, Los Angeles
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Prudential Real Estate Investors % Marc Selznick
Reverse Thrust LLC
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SOMA Partners % ROK Properties
Southern Pacific Transportation Co.
Stanwood Alyce M
State Property
Steel Arc Properties LLC
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Timothy A. Tosta Steefel Levitt & Weiss
Townsend Street Property LLP % Anne McKnight
Julian Unger

## Agencies/Businesses/Associations/Individual Receiving Notice of Availability of Final EIS/EIR

### City and County of San Francisco Agencies

Bureau of Energy Conservation, Hetchy Hetchy Water & Power
Bureau of Fire Prevention & Investigation
City Attorney's Office
Department of Building Inspection
Landmarks Preservation Advisory Board
Mayor's Office of Community Development
Mayor's Office of Housing
Port of San Francisco
San Francisco Department of Public Works
San Francisco Public Utilities Commission
San Francisco Real Estate Department
San Francisco Community College District
San Francisco Fire Dept - Planning & Research
San Francisco Police Dept - Planning Division
San Francisco Public Utilities Commission
San Francisco Recreation & Parks
San Francisco Unified School District

### Community Groups and Organizations

AIA - San Francisco Chapter
Bay Area Council
Chinatown Resource Center
Mission Creek Harbor Association
Natoma / SOMA Neighborhood Association
Pedestrian Safety Task Force
PODER
Portside Homeowners Association
Protrero Boosters Neighborhood Association
San Francisco Beautiful
San Francisco Chamber of Commerce
San Francisco Labor Council
SELT
Sierra Club - San Francisco Group
SOMPAC Land Use Committee Chair
South of Market Cultural Center (SAMAR)
The People on the Bus
Yerba Buena Alliance
Coalition for San Francisco Neighborhoods
South of Market Neighborhood Association
South of Market Problem Solving
South of Market Project Action Committee
South of Market Senior Community Action Group
South Park Improvement Association
South Waterfront Alliance
Tenants & Owners Development Corp.

### Businesses

Bethea Wilson & Associates Art In Architecture
Brobeck, Phleger, Harrison
Cahill Contractors, Inc.
Catellus Development Corporation
Chicago Title
Coldwell Banker
David P. Rhoades & Associates
DKS Associates
Dyett & Bhatia
EDAW
EIP Associates
Ellman Burke Hoffman & Johnson

Environmental Science Associates, Inc.
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The Jefferson Company
Wilson Cornerstone
AMTRAK
Greyhound
Union Pacific Railroad Company

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Elizabeth Davis Hincs
Marc Hofstadter

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# APPENDIX B: LIST OF PREPARERS

**Federal Transit Administration (FTA)**

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Jerome Wiggins, Transportation Representative, Region IX

Renee Marler, Regional Counsel, Region IX

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Marie Pang, Environmental Manager

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John Bumanis, P.E., Chief Mechanical Engineer. B.S., Mechanical Engineering. More than 20 years of experience in planning and designing heating, ventilating, and air conditioning systems for subway facilities.

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Jeanne Hazemoto, Supervisor of Word Processing and Office Support. Document preparation and production. Fourteen years experience in production word processing.

David Johnson, Principal Planner. B.A., Geography. 13 years experience in environmental and transportation planning.

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**ESA**

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Dan Cohen, Reviewer. M.C.P.; B.A., History and Political Economy. Ten years of experience specializing in the management of EIRs for mid-size and large urban development projects. Technical expertise in the areas of historic architectural resources, urban design/visual quality, and land use.

Michael Jacinto, Deputy Project Manager/Planner. B.A., Urban Studies/German Language and Literature. Three years of experience in technical analyses for numerous planning and environmental projects related to commercial, residential and mixed-use projects.

Alison Malkin, Planner. B.S., Environmental Studies/Geography and Environmental Science. Three years of experience in preparing technical analyses for numerous planning and environmental projects related to commercial, office and mixed-use projects.

Diane Wong, Project Co-Manager. B.S., Architecture. Over 12 years of experience in the field of urban and environmental planning, including project management of environmental documents.

**Harris Miller Miller & Hanson**

Hugh J. Saurenman, Principal Consultant/Vice President. Ph.D., Mechanical Engineering. 25 years of experience in urban transit projects. Authored several key reference documents used throughout the transit industry. Has developed state-of-the-art ground-borne vibration prediction methodologies.

Herb L. Singleton, Senior Consultant. S.B., Mechanical Engineering. Five years of experience in various environmental noise and vibration control projects for rail and other modes of surface transportation. Particularly in the areas of field survey measurements, environmental assessments, and computer modeling of noise and vibration propagation.

**JRP Historical Consulting Services**

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**Moore Iacofano Goltsman**

Daniel Iacofano, Principal-in-Charge. Ph.D., A.I.C.P. 24 years experience in environmental planning, public participation, inter-agency collaboration and facilitation.

Andy Pendoley, Project Manager. B.A., Sociology. Four years experience in supporting major public participation processes with project management, facilitation, graphic recording, and writing services.

Joyce Vollmer, Communications Manager. M.A., English. Over 20 years experience in marketing, employee communications and public relations.

**Nelson\Nygaard Consulting Associates**

Kevin Dwarka, Project Manager. M.S., Urban and Regional Planning. Over five years of experience in transit planning and multimodal planning and operations.

Barb Laurenson, Senior Associate. M.S., Urban Planning. Over five years experience in transportation demand management, pedestrian and bicycle impact analysis.

Bonnie Weinstein Nelson, Senior Partner. M.S., Civil Engineering. Over 20 years experience in transit planning and operations, including extensive experience in assessing the transportation impacts of major projects.

**Sedway Group**

Amy L. Herman, Managing Director. B.A., Urban Policy Studies; M.C.P. 19 years experience in urban economic and real estate consulting.

Benjamin Levine, Real Estate Analyst. B.A., Economics. Over two years experience in real estate research and analysis.

Mary Smitheram-Sheldon, Managing Director. B.S., Business Administration. 13 years experience in real estate consulting, strategy, and valuation.

**Terry A. Hayes Associates**

Keith Cooper, Assistant Planner. M.A. candidate, three years experience in urban planning.

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**Heller-Manus Architects**

# APPENDIX C: GLOSSARY / ACRONYMS

**Definitions and Abbreviations**

**ACA4** - Assembly Constitutional Amendment 4

**acre** - A unit of measurement of area equivalent to 43,560 square feet.

**alluvium** - Deposits resulting from the operations of water including floodplains, lakes, rivers and fans at the foot of mountain slopes.

**candidate species** - Any species of fish, wildlife or plant which has been determined to be a candidate for listing under Section 4 of the Endangered Species Act of 1973 (amended).

**Corps of Engineers** - (COE) U.S. Army Corps of Engineers. Federal agency with jurisdiction over wetlands and waters of the U.S.

**cultural resources** - Archaeological and historic resources that could potentially be affected by a given project. Cultural resources include buildings, sites, districts, structures or objects having historical, architectural, archaeological, cultural or scientific importance.

**cumulative impact** - The impact on the environment that results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions.

**dBA** - A sound level in decibels, measured with a sound level meter having metering characteristics and frequency weighting specified in American National Standard Specifications for sound level meters ANSIS1.4-1971. It is common to refer to numerical units of an A-weighted sound level as "dBA."

**DEIS/EIR** - Draft Environmental Impact Statement/Report. A report that identifies and analyzes potential environmental effects of a preferred project alternative.

**Electromagnetic field (EMF)** – electromagnetic fields associated with electromagnetic radiation.

**Electromagnetic interference (EMI)** – Electromagnetic interference may include the interruption, obstruction, or other degradation in the effective performance of

**EPA** - U.S. Environmental Protection Agency. The federal agency responsible for maintaining environmental quality including air quality, noise and hazardous waste management.

**FEIS/EIR** - Final Environmental Impact Statement/Report. A report that identifies and analyzes potential environmental effects of a preferred project alternative and responds to comments received on the DEIS/R.

**fill** - Earth used to create embankments or to raise low-lying areas in order to bring them to grade.

**floodplain** - The part of the ground surface inundated with water on a recurring basis, usually associated with the one percent recurrence interval (100-year) flow.

**g** - horizontal ground acceleration

**gram** - Unit of measurement of mass, metric system.

**ha** - hectare (10,000 square meters)

**HOV** - High Occupancy Vehicle. A "carpool," or vehicle occupied by two or more persons.

**HOV Lane** - High Occupancy Vehicle lane. A system of exclusive lanes signed and striped for use by vehicles with multiple occupants (two or more persons) or ridership. HOV lanes are designed on roadways to reduce traffic congestion, improve safety, and reduce fuel consumption and to improve air quality.

**Kilo** - Prefix used in metric measurement, 1000.

**kiss-and-ride** - A passenger loading area where vehicles can pick up and drop off passengers.

**km** - Kilometer.

**kmph** - Kilometer per hour.

**KV** - Kilovolt.

**Ldn** - Day-Night Equivalent Sound Level. A 24-hour equivalent sound level with a 10 dB penalty assessed to noise events occurring at night (10 p.m. to 7 a.m.).

**Leq** - Equivalent Sound Level. A measure of sound energy over a period of time, or a sound level which, in a stated period of time, would contain the same acoustical energy as the time-varying sound during the same period.

**liter** - Unit of measurement of volume (metric system).

**LOS (Level of Service)** - The operating level of an intersection or roadway segment can be described using the term Level of Service. Level of Service is a qualitative description of operation based on delay and maneuverability. It can range from "A," representing free flow conditions, to "F" representing gridlock.

**m** - Meter.

**mG** - MilliGauss.

**mitigation** - Measures taken to minimize adverse environmental impacts. Mitigation could reduce the magnitude and extent of an impact from a level of significance to a level of insignificance.

**mph** - Miles per hour.

**mT** - MicroTesla.

**National Historic Preservation Act of 1966** - The primary federal law pertaining to protection of cultural resources.

**National Register of Historic Places** - A federal listing of historic resources protected under the National Historic Preservation Act of 1966.

**NEPA** - National Environmental Policy Act. The United States' basic national charter for protection of the environment. It establishes policy, sets goals and provides means for carrying out the policy.

**nonpoint source** - Pertains to the discharge of pollutants into waters or air where the pollutant sources come from an area rather than a single source that can be pinpointed.

**$NO_X$** - Nitrogen Oxide.

**National Register-eligible** - Cultural resources determined eligible for inclusion on the National Register of Historic Places.

**$O_3$** - Ozone.

**ozone** - A major component of photochemical smog, which is formed in the atmosphere by the chemical reaction between nitrogen dioxide and organic gases in the presence of sunlight. Excessive levels of ozone can cause eye irritation, reduced visibility, vegetation damage and aggravation of respiratory conditions. The biggest source of these gases is the automobile.

**park-and-ride** - A parking area intended for transit riders who arrive at transit stations by car.

**Pb** - Lead.

**$PM_{2.5}$** - Particulate matter less than 2.5 microns in diameter, considered to be fine particulate matter. (One micron is equal to one-millionth of a meter.)

**$PM_{10}$** - Particulate matter less than 10 microns in diameter. (One micron is equal to one-millionth of a meter.)

**ppm** - parts per million.

**PPV** - Peak particle velocity. The maximum instantaneous peak in the velocity of an object's vibratory motion. The PPV is used to define thresholds of potential building damage from vibration.

**right-of-way** - Land dedicated to the transportation facility.

**RMS** - Root-mean-square amplitude. The average energy of vibrating measured over a short time interval, usually one second. RMS vibration velocity is considered the best available measure of potential human annoyance from ground-borne vibration.

**Section 106** - Section 106 of the National Historic Preservation Act of 1966.

**$SO_2$** - Sulphur Dioxide.

**SIP** - State Implementation Plan – a plan for attaining national ambient air quality standards required by the Clean Air Act.

**USFWS** - U.S. Fish and Wildlife Service. The federal agency that administers the federal Endangered Species Act and is involved in protection of fish and wildlife habitat including wetland areas.

**Vdb** - Decibels of vibration velocity. An expression of ground-borne vibrations.

**watershed** - That part of the earth's surface from which storm water runoff flows to a single point.

**wetlands** - According to the U.S. Army Corps of Engineers, wetlands are areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, under normal conditions, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes and similar areas, and are subject to protection under Executive Order 11990 and Section 404 of the Clean Water Act (CWA).

## Glossary of Acronyms

| | |
|---|---|
| AB | Assembly Bill |
| ABAG | Association of Bay Area Governments |
| AC | Alternating current |
| AC Transit | Alameda Contra Costa Transit District |
| ACHP | Advisory Council on Historic Preservation |
| ADA | Americans with Disabilities Act |
| ADT | Average Daily Traffic |
| APE | Area of Potential Effects |
| APTA | American Public Transit Association |
| ATS | Automated Train Stop |
| AWSS | Auxiliary Water Supply System |
| BAAB | Bay Area Air Basin |
| BAAQMD | Bay Area Air Quality Management District |
| BART | Bay Area Rapid Transit |
| BATA | Bay Area toll Authority |
| BTU - | British Thermal Unit. |
| BCDC | Bay Conservation and Development Commission |
| CAA | Clean Air Act of 1970 |
| CAAQS | California Ambient Air Quality Standards |
| CAC | Community Advisory Committee |
| CALINE4 | Computer model used to predict carbon monoxide levels |
| CALTRANS | California Department of Transportation |
| CARB | California Air Resources Board |
| CBD | Central Business District |
| CCAA | California Clean Air Act |
| CCSF | City and County of San Francisco |
| CDFG | California Department of Fish and Game |
| CEQA | California Environmental Quality Act |
| CERCLA | Comprehensive Environmental Response Compensation & Liability Act |
| CERCLIS | Comprehensive Environmental Response Compensation Information System |
| CFR | Code of Federal Regulations |
| CHP | California Highway Patrol |
| CLUP | Comprehensive Land Use Plan |
| CM | Construction Management |
| CMAQ | Congestion Mitigation and Air Quality Improvement Program |
| CNDDB | California Natural Diversity Data Base |
| CNPS | California Native Plant Society |
| CO | Carbon Monoxide |
| COE | Army Corps of Engineers |
| CTC - | California Transportation Commission or Centralized Train Control |
| CPUC | California Public Utilities Commission |

| | |
|---|---|
| CY | Cubic yards. |
| DC - | Direct current. |
| CFR | Codified Federal Regulations |
| CZMA | Coastal Zone Management Act |
| DEIS/EIR | Draft Environmental Impact Statement/Environmental Impact Report |
| DPT | Department of Parking and Traffic |
| DPW | Department of Public Works |
| DWR | Department of Water Resources |
| EIR | Environmental Impact Report |
| EIS | Environmental Impact Statement |
| EMU | Electrical Multiple Unit |
| EPA | Environmental Protection Agency |
| FEIS/EIR | Final Environmental Impact Statement/Report |
| FHWA | Federal Highway Administration |
| FPPA | Farmland Protection Policy Act |
| FTA | Federal Transit Administration |
| FVM | Fare Vending Machine |
| FY | Fiscal Year |
| GGBHT | Golden Gate Bridge, Highway and Transportation District |
| HASR | Historical Architectural Survey Report |
| HPSR | Historic Property Survey Report |
| HOV | High Occupancy Vehicle |
| Hz | Hertz. |
| I-280 | Interstate 280 |
| ISP | Iron/Steel Pipe |
| ISTEA | Intermodal Surface Transportation Act of 1991 |
| ITIP | Interregional Transportation Improvement Program |
| JPA | Joint Exercise of Powers Agency |
| JPB | Peninsula Corridor Joint Powers Board |
| LOS | Level of Service |
| LPA | Locally Preferred Alternative |
| LUST | Leaking Underground Storage Tank |
| MOA | Memorandum of agreement |
| MGP | Manufactured Gas Plant |
| MPO | Metropolitan Planning Organization |
| MTC | Metropolitan Transportation Commission |
| Muni | San Francisco Municipal Railway |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NOI | Notice of Intent |
| NOP | Notice of Preparation |
| NPDES | National Pollutant Discharge Elimination System |
| NRHP | National Register of Historic Properties |
| O&M | Operating and Maintenance |
| OCS | Overhead Control System |

| | |
|---|---|
| OSHA | Occupational Safety and Health Administration |
| PAH | Polyaromatic Hydrocarbons |
| PPA | Pollution Prevention Act |
| RIP | Regional Improvement Program |
| ROD | Record of Decision |
| RTP | Regional Transportation Plan |
| RTIP | Regional Transportation Improvement Program |
| RWQCB | Regional Water Quality Board |
| SAA | Streambed Alteration Agreement |
| SAMTRANS | San Mateo County Transportation |
| SFAH | San Francisco Architectural Heritage |
| SFBRWQB | San Francisco Bay Regional Water Quality Control Board |
| SFIA | San Francisco Institute of Architecture |
| SFRA | San Francisco Redevelopment Agency |
| SHPO | State Historic Preservation Office or Officer |
| SIP | State Implementation Plan |
| SOMA | South of Market Area |
| SP | Southern Pacific (Railroad) |
| SPR | Southern Pacific Railroad |
| SRTP | Short Range Transit Plan |
| STA | State Transit Assistance program. |
| STP | State Transportation Program |
| STIP | State Transportation Improvement Program |
| SWPPP | Storm Water Pollution Prevention Plan |
| TAC | Technical Advisory Committee |
| TAZ | Traffic Analysis Zone |
| TCM | Transportation Control Measure |
| TCRP | Transportation Congestion Relief Program |
| TDM | Transportation Demand Management |
| TEA-21 | Transportation Equity Act for the 21st Century |
| TIP | Transportation Improvement Program |
| TIFIA | Transportation Infrastructure Financing and Innovation Act |
| TJPA | Transbay Joint Powers Authority |
| TRP | Trip Reduction Program |
| TSM | Transportation Systems Management |
| US 101 | US Highway 101 |
| USEPA | US Environmental Protection Agency |
| USFWS | US Fish and Wildlife Service |
| USGS | US Geological Survey |
| UST | Underground Storage Tank |
| VC | Volume-to-Capacity Ratio |
| VCP | Vitrified Clay Pipe |
| VHT | Vehicle Hours of Travel |
| VMT | Vehicle Miles of Travel |

# APPENDIX D: AGENCY LETTERS

# United States Department of the Interior

**FISH AND WILDLIFE SERVICE**
**Sacramento Fish and Wildlife Office**
**2800 Cottage Way, Room W-2605**
**Sacramento, California 95825-1846**

IN REPLY REFER TO:
1-1-01-SP-2843

August 10, 2001

Ms. Laura J. Prickett
Principal Planner
Parsons Transportation Group
120 Howard Street
Suite 850
San Francisco, California 94105

Subject: Species List for San Francisco Transbay Terminal/Caltrain Downtown Extension Project, San Francisco County, California

Dear Ms. Prickett:

We are sending the enclosed list in response to your August, 6, 2001, request for information about endangered and threatened species (Enclosure A). The list covers the following U.S. Geological Survey 7½ minute quad or quads: San Francisco North Quad.

Please read *Important Information About Your Species List* (enclosed). It explains how we made the list and describes your responsibilities under the Endangered Species Act. Please contact Harry Mossman, Biological Technician, at (916) 414-6674, if you have any questions about the attached list or your responsibilities under the Endangered Species Act. For the fastest response to species list requests, address them to the attention of Mr. Mossman at this address. You may fax requests to him at 414-6712 or 6713.

Sincerely,

Mick Steen for

Jan C. Knight
Chief, Endangered Species Division

Enclosures

RECEIVED
AUG 13 2001
Parsons Transportation Group
San Francisco

# Important Information
# About Your Species List

## How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute *quads*. The United States is divided into these quads, which are about the size of San Francisco. If you requested your list by quad name or number, that is what we used. Otherwise, we used the information you sent us to determine which quad or quads to use.

## Animals

The animals on your species list are ones that occur within, *or may be affected by projects within*, the quads covered by the list. Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.

## Plants

Any plants on your list are ones *that have actually been observed* in the quad or quads covered by the list. We have also included either a county species list or a list of species in nearby quads. We recommend that you check your project area for these plants. Plants may exist in an area without ever having been detected there.

## Surveying

Some of the species on your list may not be affected by your project. A trained biologist or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. For plant surveys, we recommend using the enclosed *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Species*. The results of your surveys should be published in any environmental documents prepared for your project.

## State-Listed Species

If a species has been listed as threatened or endangered by the State of California, but not by us nor by the National Marine Fisheries Service, it will appear on your list as a Species of Concern. *However you should contact the California Department of Fish and Game for official information about these species.* Call (916) 322-2493 or write Marketing Manager, California Department of Fish and Game, Natural Diversity Data Base, 1416 Ninth Street, Sacramento, California 95814.

## Your Responsibilities Under the Endangered Species Act

All plants and animals identified as *listed* on Enclosure A are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the *take* of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal. Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

> If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a *formal consultation* with the Service. Such consultation would result in a *biological opinion* addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.
>
> If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an *incidental take permit*. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project. Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that mitigates for the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the mitigation plan in any environmental documents you file.

## Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as *critical habitat*. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Maps and boundary descriptions of the critical habitat may be found in the *Federal Register*. The information is also reprinted in the *Code of Federal Regulations* (50 **CFR** 17.95).

## Candidate Species

We recommend that you address impacts to *candidate* species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Your list may contain a section called *Species of Concern*. This term includes former *category 2 candidate species* and other plants and animals of concern to the Service and other Federal, State and private conservation agencies and organizations. Some of these species may become candidate species in the future.

## Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

## Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed, candidate and special concern species in your planning, this should not be a problem. We also continually strive to make our information as accurate as possible. Sometimes we learn that a particular species has a different range than we thought. This should not be a problem if you consider the species on the county or surrounding-quad lists that we have enclosed. If you have a long-term project or if your project is delayed, please feel free to contact us about getting a current list. You can also find out the current status of a species by going to the Service's Internet page: *www.fws.gov*

GUIDELINES FOR CONDUCTING AND REPORTING BOTANICAL INVENTORIES FOR FEDERALLY LISTED, PROPOSED AND CANDIDATE PLANTS
(September 23, 1996)

These guidelines describe protocols for conducting botanical inventories for federally listed, proposed and candidate plants, and describe minimum standards for reporting results. The Service will use, in part, the information outlined below in determining whether the project under consideration may affect any listed, proposed or candidate plants, and in determining the direct, indirect, and cumulative effects.

Field inventories should be conducted in a manner that will locate listed, proposed, or candidate species (target species) that may be present. The entire project area requires a botanical inventory, except developed agricultural lands. The field investigator(s) should:

1. Conduct inventories at the appropriate times of year when target species are present and identifiable. Inventories will include all potential habitats. Multiple site visits during a field season may be necessary to make observations during the appropriate phenological stage of all target species.

2. If available, use a regional or local reference population to obtain a visual image of the target species and associated habitat(s). If access to reference populations is not available, investigators should study specimens from local herbaria.

3. List every species observed and compile a comprehensive list of vascular plants for the entire project site. Vascular plants need to be identified to a taxonomic level which allows rarity to be determined.

4. Report results of botanical field inventories that include:

    a. a description of the biological setting, including plant community, topography, soils, potential habitat of target species, and an evaluation of environmental conditions, such as timing or quantity of rainfall, which may influence the performance and expression of target species.

    b. a map of project location showing scale, orientation, project boundaries, parcel size, and map quadrangle name.

    c. survey dates and survey methodology(ies).

    d. if a reference population is available, provide a written narrative describing the target species reference population(s) used, and date(s) when observations were made.

    e. a comprehensive list of all vascular plants occurring on the project site for each habitat type.

    f. current and historic land uses of the habitat(s) and degree of site alteration.

g. presence of target species off-site on adjacent parcels, if known.

h. an assessment of the biological significance or ecological quality of the project site in a local and regional context.

5. If target species is(are) found, report results that additionally include:

a. a map showing federally listed, proposed and candidate species distribution as they relate to the proposed project.

b. if target species is (are) associated with wetlands, a description of the direction and integrity of flow of surface hydrology. If target species is (are) affected by adjacent off-site hydrological influences, describe these factors.

c. the target species phenology and microhabitat, an estimate of the number of individuals of each target species per unit area; identify areas of high, medium and low density of target species over the project site, and provide acres of occupied habitat of target species. Investigators could provide color slides, photos or color copies of photos of target species or representative habitats to support information or descriptions contained in reports.

d. the degree of impact(s), if any, of the proposed project as it relates to the potential unoccupied habitat of target habitat.

6. Document findings of target species by completing California Native Species Field Survey Form(s) and submit form(s) to the Natural Diversity Data Base. Documentation of determinations and/or voucher specimens may be useful in cases of taxonomic ambiguities, habitat or range extensions.

7. Report as an addendum to the original survey, any change in abundance and distribution of target plants in subsequent years. Project sites with inventories older than three years from the current date of project proposal submission will likely need additional survey. Investigators need to assess whether an additional survey(s) is (are) needed.

8. Adverse conditions may prevent investigator(s) from determining presence or identifying some target species in potential habitat(s) of target species. Disease, drought, predation, or herbivory may preclude the presence or identification of target species in any year. An additional botanical inventory(ies) in a subsequent year(s) may be required if adverse conditions occur in a potential habitat(s). Investigator(s) may need to discuss such conditions.

9. Guidance from California Department of Fish and Game (CDFG) regarding plant and plant community surveys can be found in Guidelines for Assessing the Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities, 1984. Please contact the CDFG Regional Office for questions regarding the CDFG guidelines and for assistance in determining any applicable State regulatory requirements.

ENCLOSURE A

Endangered and Threatened Species that May Occur in or be Affected by

PROJECTS IN SAN FRANCISCO COUNTY

Reference File No. 1-1-01-SP-2843

August 10, 2001

***Listed Species***

Mammals

- sei whale, *Balaenoptera borealis* (E)
- blue whale, *Balaenoptera musculus* (E)
- finback (=fin) whale, *Balaenoptera physalus* (E)
- right whale, *Eubalaena glacialis* (E)
- humpback whale, *Megaptera novaeangliae* (E)
- sperm whale, *Physeter catodon (=macrocephalus)* (E)
- salt marsh harvest mouse, *Reithrodontomys raviventris* (E)
- Guadalupe fur seal, *Arctocephalus townsendi* (T)
- Critical Habitat, Steller (=northern) sea-lion, *Eumetopias jubatus* (T)
- Steller (=northern) sea-lion, *Eumetopias jubatus* (T)

Birds

- California brown pelican, *Pelecanus occidentalis californicus* (E)
- California clapper rail, *Rallus longirostris obsoletus* (E)
- western snowy plover, *Charadrius alexandrinus nivosus* (T)
- bald eagle, *Haliaeetus leucocephalus* (T)

Reptiles

- leatherback turtle, *Dermochelys coriacea* (E)
- loggerhead turtle, *Caretta caretta* (T)
- green turtle, *Chelonia mydas (incl. agassizi)* (T)
- olive (=Pacific) ridley sea turtle, *Lepidochelys olivacea* (T)
- Alameda whipsnake, *Masticophis lateralis euryxanthus* (T)
- Critical habitat, Alameda whipsnake, *Masticophis lateralis euryxanthus* (T)

Amphibians

- California red-legged frog, *Rana aurora draytonii* (T)

Fish

- tidewater goby, *Eucyclogobius newberryi* (E)
- Critical habitat, winter-run chinook salmon, *Oncorhynchus tshawytscha* (E)
- winter-run chinook salmon, *Oncorhynchus tshawytscha* (E)
- Central California Coastal steelhead, *Oncorhynchus mykiss* (T)
- Sacramento splittail, *Pogonichthys macrolepidotus* (T)
- delta smelt, *Hypomesus transpacificus* (T) *

Invertebrates

white abalone, *Haliotes sorenseni* (E)
mission blue butterfly, *Icaricia icarioides missionensis* (E)
San Bruno elfin butterfly, *Incisalia mossii bayensis* (E)

Plants

Presidio (=Raven's) manzanita, *Arctostaphylos hookeri ssp. ravenii* (E)
Presidio clarkia, *Clarkia franciscana* (E)
San Francisco lessingia, *Lessingia germanorum* (E)
Marin dwarf-flax, *Hesperolinon congestum* (T)
marsh sandwort, *Arenaria paludicola* (E) *
beach layia, *Layia carnosa* (E) *

***Proposed Species***

Birds

short-tailed albatross, *Diomedea albatrus* (PE)

***Candidate Species***

Amphibians

California tiger salamander, *Ambystoma californiense* (C)

Invertebrates

black abalone, *Haliotes cracherodii* (C)

***Species of Concern***

Mammals

gray whale, *Eschrichtius robustus* (D)
Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)
greater western mastiff-bat, *Eumops perotis californicus* (SC)
long-eared myotis bat, *Myotis evotis* (SC)
fringed myotis bat, *Myotis thysanodes* (SC)
long-legged myotis bat, *Myotis volans* (SC)
Yuma myotis bat, *Myotis yumanensis* (SC)
San Francisco dusky-footed woodrat, *Neotoma fuscipes annectens* (SC)
salt marsh vagrant shrew, *Sorex vagrans halicoetes* (SC)

Birds

little willow flycatcher, *Empidonax traillii brewsteri* (CA)
black rail, *Laterallus jamaicensis coturniculus* (CA)
bank swallow, *Riparia riparia* (CA)
American peregrine falcon, *Falco peregrinus anatum* (D)
Snowy Egret, *Egretta thula* (MB)
tricolored blackbird, *Agelaius tricolor* (SC)
grasshopper sparrow, *Ammodramus savannarum* (SC)

Bell's sage sparrow, *Amphispiza belli belli* (SC)
American bittern, *Botaurus lentiginosus* (SC)
ferruginous hawk, *Buteo regalis* (SC)
Vaux's swift, *Chaetura vauxi* (SC)
lark sparrow, *Chondestes grammacus* (SC)
olive-sided flycatcher, *Contopus cooperi* (SC)
hermit warbler, *Dendroica occidentalis* (SC)
white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)
Pacific-slope flycatcher, *Empidonax difficilis* (SC)
common loon, *Gavia immer* (SC)
saltmarsh common yellowthroat, *Geothlypis trichas sinuosa* (SC)
loggerhead shrike, *Lanius ludovicianus* (SC)
Alameda (South Bay) song sparrow, *Melospiza melodia pusillula* (SC)
long-billed curlew, *Numenius americanus* (SC)
ashy storm-petrel, *Oceanodroma homochroa* (SC)
rufous hummingbird, *Selasphorus rufus* (SC)
Allen's hummingbird, *Selasphorus sasin* (SC)
red-breasted sapsucker, *Sphyrapicus ruber* (SC)
elegant tern, *Sterna elegans* (SC)
Xantus' murrelet, *Synthliboramphus hypoleucus* (SC)

Reptiles

northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
southwestern pond turtle, *Clemmys marmorata pallida* (SC)
California horned lizard, *Phrynosoma coronatum frontale* (SC)

Amphibians

foothill yellow-legged frog, *Rana boylii* (SC)

Fish

green sturgeon, *Acipenser medirostris* (SC)
river lamprey, *Lampetra ayresi* (SC)
Pacific lamprey, *Lampetra tridentata* (SC)
longfin smelt, *Spirinchus thaleichthys* (SC)

Invertebrates

Opler's longhorn moth, *Adela oplerella* (SC)
sandy beach tiger beetle, *Cicindela hirticollis gravida* (SC)
globose dune beetle, *Coelus globosus* (SC)
Ricksecker's water scavenger beetle, *Hydrochara rickseckeri* (SC)
bumblebee scarab beetle, *Lichnanthe ursina* (SC)

Plants

salt marsh owl's clover (=johnny-nip), *Castilleja ambigua ssp. ambigua* (SC)

San Francisco Bay spineflower, *Chorizanthe cuspidata var. cuspidata* (SC)
San Francisco wallflower, *Erysimum franciscanum* (SC)
fragrant fritillary, *Fritillaria liliacea* (SC)
San Francisco gumplant, *Grindelia hirsutula var. maritima* (SC)
Marin checkermallow, *Sidalcea hickmanii ssp. viridis* (SC)
Mission Delores campion, *Silene verecunda ssp. verecunda* (SC)
Pacific cordgrass (=California cordgrass), *Sparina foliosa* (SC)
San Francisco owl's-clover, *Triphysaria floribunda* (SC)
San Francisco popcornflower, *Plagiobothrys diffusus* (CA) *
alkali milk-vetch, *Astragalus tener var. tener* (SC) *
compact cobweb thistle, *Cirsium occidentale var. compactum* (SC) *
Diablo helianthella (=rock-rose), *Helianthella castanea* (SC) *
Kellogg's (wedge-leaved) horkelia, *Horkelia cuneata ssp. sericea* (SC) *
adobe sanicle, *Sanicula maritima* (SC) *
San Francisco manzanita, *Arctostaphylos hookeri ssp. franciscana* (SC) **
coast lily, *Lilium maritimum* (SC) ?*

KEY:

| | | |
|---|---|---|
| (E) | *Endangered* | Listed (in the Federal Register) as being in danger of extinction. |
| (T) | *Threatened* | Listed as likely to become endangered within the foreseeable future. |
| (P) | *Proposed* | Officially proposed (in the Federal Register) for listing as endangered or threatened. |
| (PX) | *Proposed Critical Habitat* | Proposed as an area essential to the conservation of the species. |
| (C) | *Candidate* | Candidate to become a *proposed* species. |
| (SC) | *Species of Concern* | Other species of concern to the Service. |
| (D) | *Delisted* | Delisted. Status to be monitored for 5 years. |
| (CA) | *State-Listed* | Listed as threatened or endangered by the State of California. |
| * | *Extirpated* | Possibly extirpated from the area. |
| ** | *Extinct* | Possibly extinct |
| | *Critical Habitat* | Area essential to the conservation of a species. |

Invertebrates

white abalone, *Haliotes sorenseni* (E)

mission blue butterfly, *Icaricia icarioides missionensis* (E)

San Bruno elfin butterfly, *Incisalia mossii bayensis* (E)

Plants

Presidio (=Raven's) manzanita, *Arctostaphylos hookeri ssp. ravenii* (E)

marsh sandwort, *Arenaria paludicola* (E) *

Presidio clarkia, *Clarkia franciscana* (E)

Marin dwarf-flax, *Hesperolinon congestum* (T)

beach layia, *Layia carnosa* (E) *

San Francisco lessingia, *Lessingia germanorum* (E)

***Proposed Species***

Birds

short-tailed albatross, *Diomedea albatrus* (PE)

***Candidate Species***

Amphibians

California tiger salamander, *Ambystoma californiense* (C)

Fish

Central Valley fall/late fall-run chinook salmon, *Oncorhynchus tshawytscha* (C)

Critical habitat, Central Valley fall/late fall-run chinook, *Oncorhynchus tshawytscha* (C)

Invertebrates

black abalone, *Haliotes cracherodii* (C)

***Species of Concern***

Mammals

Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)

gray whale, *Eschrichtius robustus* (D)

greater western mastiff-bat, *Eumops perotis californicus* (SC)

long-eared myotis bat, *Myotis evotis* (SC)

fringed myotis bat, *Myotis thysanodes* (SC)

long-legged myotis bat, *Myotis volans* (SC)

Yuma myotis bat, *Myotis yumanensis* (SC)

San Francisco dusky-footed woodrat, *Neotoma fuscipes annectens* (SC)

Point Reyes jumping mouse, *Zapus trinotatus orarius* (SC)

ENCLOSURE A

Endangered and Threatened Species that May Occur in
or be Affected by Projects in the Selected Quads Listed Below
Reference File No. 1-1-01-SP-2843
August 10, 2001

QUAD : 466C SAN FRANCISCO NORTH

***Listed Species***

Mammals

Guadalupe fur seal, *Arctocephalus townsendi* (T)

sei whale, *Balaenoptera borealis* (E)

blue whale, *Balaenoptera musculus* (E)

finback (=fin) whale, *Balaenoptera physalus* (E)

right whale, *Eubalaena glacialis* (E)

Critical Habitat, Steller (=northern) sea-lion, *Eumetopias jubatus* (T)

Steller (=northern) sea-lion, *Eumetopias jubatus* (T)

sperm whale, *Physeter catodon (=macrocephalus)* (E)

salt marsh harvest mouse, *Reithrodontomys raviventris* (E) *

Birds

western snowy plover, *Charadrius alexandrinus nivosus* (T)

bald eagle, *Haliaeetus leucocephalus* (T)

California brown pelican, *Pelecanus occidentalis californicus* (E)

California clapper rail, *Rallus longirostris obsoletus* (E) *

Amphibians

California red-legged frog, *Rana aurora draytonii* (T)

Fish

tidewater goby, *Eucyclogobius newberryi* (E)

delta smelt, *Hypomesus transpacificus* (T)

Critical habitat, coho salmon - central CA coast, *Oncorhynchus kisutch* (T)

coho salmon - central CA coast, *Oncorhynchus kisutch* (T)

Central California Coastal steelhead, *Oncorhynchus mykiss* (T)

Critical habitat, winter-run chinook salmon, *Oncorhynchus tshawytscha* (E)

winter-run chinook salmon, *Oncorhynchus tshawytscha* (E)

Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T)

Critical Habitat, Central Valley spring-run chinook, *Oncorhynchus tshawytscha* (T)

Sacramento splittail, *Pogonichthys macrolepidotus* (T)

Birds

- tricolored blackbird, *Agelaius tricolor* (SC)
- grasshopper sparrow, *Ammodramus savannarum* (SC)
- Bell's sage sparrow, *Amphispiza belli belli* (SC)
- short-eared owl, *Asio flammeus* (SC)
- ferruginous hawk, *Buteo regalis* (SC)
- white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)
- little willow flycatcher, *Empidonax traillii brewsteri* (CA)
- American peregrine falcon, *Falco peregrinus anatum* (D)
- saltmarsh common yellowthroat, *Geothlypis trichas sinuosa* (SC)
- black rail, *Laterallus jamaicensis coturniculus* (CA)
- ashy storm-petrel, *Oceanodroma homochroa* (SC)
- rufous hummingbird, *Selasphorus rufus* (SC)
- Allen's hummingbird, *Selasphorus sasin* (SC)
- elegant tern, *Sterna elegans* (SC)

Reptiles

- northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
- southwestern pond turtle, *Clemmys marmorata pallida* (SC)
- California horned lizard, *Phrynosoma coronatum frontale* (SC)

Amphibians

- foothill yellow-legged frog, *Rana boylii* (SC)

Fish

- longfin smelt, *Spirinchus thaleichthys* (SC)

Invertebrates

- Opler's longhorn moth, *Adela oplerella* (SC)
- sandy beach tiger beetle, *Cicindela hirticollis gravida* (SC)
- globose dune beetle, *Coelus globosus* (SC)
- Ricksecker's water scavenger beetle, *Hydrochara rickseckeri* (SC)
- bumblebee scarab beetle, *Lichnanthe ursina* (SC)

Plants

- San Francisco manzanita, *Arctostaphylos hookeri ssp. franciscana* (SC) **
- alkali milk-vetch, *Astragalus tener var. tener* (SC) *
- San Francisco Bay spineflower, *Chorizanthe cuspidata var. cuspidata* (SC)

San Francisco gumplant, *Grindelia hirsutula var. maritima* (SC)

Kellogg's (wedge-leaved) horkelia, *Horkelia cuneata ssp. sericea* (SC) *

San Francisco popcornflower, *Plagiobothrys diffusus* (CA) *

adobe sanicle, *Sanicula maritima* (SC) *

Marin checkermallow, *Sidalcea hickmanii ssp. viridis* (SC)

Mission Delores campion, *Silene verecunda ssp. verecunda* (SC)

Pacific cordgrass (=California cordgrass), *Sparina foliosa* (SC)

San Francisco owl's-clover, *Triphysaria floribunda* (SC)

KEY:

| | | |
|---|---|---|
| (E) | *Endangered* | Listed (in the Federal Register) as being in danger of extinction. |
| (T) | *Threatened* | Listed as likely to become endangered within the foreseeable future. |
| (P) | *Proposed* | Officially proposed (in the Federal Register) for listing as endangered or threatened. |
| (PX) | *Proposed Critical Habitat* | Proposed as an area essential to the conservation of the species. |
| (C) | *Candidate* | Candidate to become a *proposed* species. |
| (SC) | *Species of Concern* | May be endangered or threatened. Not enough biological information has been gathered to support listing at this time. |
| (MB) | *Migratory Bird* | Migratory bird |
| (D) | *Delisted* | Delisted. Status to be monitored for 5 years. |
| (CA) | *State-Listed* | Listed as threatened or endangered by the State of California. |
| ( * ) | *Extirpated* | Possibly extirpated from this quad. |
| ( ** ) | *Extinct* | Possibly extinct. |
| | *Critical Habitat* | Area essential to the conservation of a species. |

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE DIRECTOR
1120 N STREET
P. O. BOX 942873
SACRAMENTO, CA 94273-0001
PHONE (916) 654-5267
FAX (916) 654-6608
TTY (916) 654-4086

Flex your power!
Be energy efficient!

November 9, 2001

Steve Heminger
Executive Director
Metropolitan Transportation Commission
101 Eighth Street
Oakland, CA 94607

Dear Mr. Heminger:

I am writing in response to your inquiring regarding the transfer of State-owned property for the proposed new Transbay Transit Terminal project in San Francisco.

As you know, Assembly Bill 1419 (Aroner), vetoed by Governor Davis, would have transferred to the City and County of San Francisco certain State-owned property for the purpose of construction and financing of the new Transbay Terminal. Although Governor Davis vetoed the bill, he indicated his support for the project and has directed the Department to initiate negotiations with the City to administratively transfer the property in such a manner as to protect the cost and timely delivery of the Department's west approach seismic safety projects and to ensure that appropriate terms and conditions would apply to any transfers.

The Department is proceeding in accordance with the Governor's direction, and we will meet with City and other appropriate officials in the next few weeks to discuss the mechanics and terms of the transfer, with the goal of moving forward as expeditiously as possible.

If the Department can provide any additional information or clarification, please contact Mr. Brent Felker, Chief Engineer, at (916) 654-6490.

Sincerely,

JEFF MORALES
Director

c: Jose Luis Moscovich

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NOV 19 2001
Parsons Transportation Group
San Francisco

STATE OF CALIFORNIA – THE RESOURCES AGENCY GRAY DAVIS, Governor

**OFFICE OF HISTORIC PRESERVATION**
**DEPARTMENT OF PARKS AND RECREATION**
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@mail2.quiknet.com

RECEIVED
JUN - 3 2002

May 23, 2002

REPLY TO: FTA011108A

Leslie T Rogers, Regional Administrator
Federal Transit Administration
Region IX
201 Mission Street, Suite 2210
SAN FRANCISCO CA 94105-1839

Re: Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project, San Francisco, San Francisco County.

Dear Mr. Rogers:

Thank you for submitting to our office your May 17, 2002 letter and Historic Property Survey Report (HPSR), Historic Architectural Survey Report (HASR), and Archeological Impact Assessment (AIA), regarding the proposed Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project in the City and County of San Francisco. The proposed project will involve three distinct components:

- A new Transbay terminal that will serve as a multi-modal transit/transportation facility at the site of the current Transbay Terminal at First and Mission Streets in downtown San Francisco. Two alternatives for this component are under consideration:

  1. The Full Loop Alternative would require demolition of the existing bus ramps that connect the existing Transbay Terminal with the San Francisco-Oakland Bay Bridge. New loops would be created in the same locations as the existing ramps thus creating a full loop.

  2. The West Ramp Alternative would remove the existing bus ramps to the Bay Bridge and replace them with a single ramp structure on the west side of the terminal. This alternative would open up for development land that is currently occupied by the bus ramp on the east side of the terminal.

- The Caltrain Downtown Extension would allow commuter rail service to be extended from its current San Francisco terminus at Fourth and Townsend Streets to a new underground terminus underneath the proposed new Transbay Terminal. This would be accomplished by:

  1. Running the Caltrain tracks through a tunnel at the existing Fourth and Townsend rail yard and continuing below grade under Townsend Street before curving at Clarence Place in a cut-and-cover configuration. The alignment would then continue as a cut-and-cover section under Second Street for approximately 2,055 feet. Tunneling

options are being considered for the portion of the alignment between Townsend and Folsom Streets.

2. Two alternatives are being considered for the proposed alignment from Second Street to the Transbay Terminal:

   a. The Second-to-Main Alternative would curve 90 degrees northeast as the alignment approaches Howard Street and continue to the basement of the new Transbay terminal. It would extend east of the new terminal curving south to Main Street to terminate south of Folsom Street. This entire alignment would be a cut-and-cover section

   b. The Second-to-Mission Alternative would curve northeasterly off of Second Street before the intersection with Howard Street. It would then cut diagonally and enter the basement of the new terminal. Two tracks would exit out under Mission Street headed towards The Embarcadero. This entire alignment would be a cut-and-cover section.

- The Redevelopment plan involves the construction of transit-oriented development on publicly-owned land in the vicinity of the new Transbay terminal. The two alternatives under consideration are:

  1. The Full Build Alternative which would provide a total of 7.6 million square feet of floor area.

  2. Th Reduced Scope Alternative which would provide 4.8 million square feet of floor area.

A full description of all of the aforementioned project alternatives is contained in the HPSR. The architectural and archeological Areas of Potential Effects (APEs) for the various project alternatives, as described in the described in the HASR the archeological documentation, appear adequate and meet the definitions set forth in 36 CFR 800.16(d). The AIA prepared by Dr. Adrian Praetzellis of the Anthropological Studies Center at Sonoma State University (November 2001) has concluded that 24 known historic and prehistoric archeological sites are located in and within one mile of the project area. Although the AIA notes that the heavy urbanization of the area makes surface location of these properties impossible to determine without extensive field work, it also notes that some general statements can be made about the relative sensitivity of the properties in relation to the proposed project elements. The AIA recommends using the Department of the Interior's *Archeology and Historic Preservation: The Secretary of the Interior's Standards and Guidelines* (48FR44716-42)(National Park Service, 1983) as a model for identifying, evaluating, and treating important archeological resources that is applicable to the proposed project. The model would consist of the following steps:

- Focused historical and geoarcheological research carried out to establish the context of the investigations.

- The preparation of a research design and treatment plan to guide field investigations and evaluations of potentially important archeological properties.

- The recordation of the technical results of the investigation in a professional report that is distributed to the project principals and the general public.

Persons who meet the Secretary of the Interior's *Professional Qualifications Standards* (48FR44738-9) would conduct all work. We do not object to the aforementioned approach to the identification, evaluation, and treatment of potential archeological properties for this undertaking.

The Federal Transit Administration (FTA) is seeking our comments on its determination of the eligibility of twelve (12) pre-1955 architectural properties located within the project APE for inclusion on the National Register of Historic Places (NRHP) in accordance with 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act. The HPSR has identified 46 pre-1955 architectural properties within the APE that are listed in or have been determined, by consensus, to be eligible for inclusion on the NRHP. The HPSR has also identified 27 pre-1955 architectural properties within the APE that have been determined, by consensus, to be ineligible for inclusion on the NRHP. Our review of the submitted documentation leads us to concur with FTA's determination that none of the 12 pre-1955 properties evaluated for this study are eligible for inclusion on the NRHP under any of the criteria established by 36 CFR 60.4. The properties have no strong associations with significant historical events or persons, are not examples of outstanding architectural design or function, and, in some cases, have lost considerable integrity of the historic architectural design and materials associated with their historic periods of significance (1906 – 1955).

Thank you again for seeking our comments on your project. We anticipate receiving from FTA, for our review and comment, a Finding of Effects (FOE) document that will outline the specific effects of a preferred project alternative on historic properties in the project APE. If you have any questions, please contact staff historian Clarence Caesar at (916) 653-8902.

Sincerely,

Dr. Knox Mellon
State Historic Preservation Officer

STATE OF CALIFORNIA – THE RESOURCES AGENCY GRAY DAVIS, Governor

**OFFICE OF HISTORIC PRESERVATION**
**DEPARTMENT OF PARKS AND RECREATION**
P.O. BOX 942896
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RECEIVED
FEB 1 9 2002

February 14, 2002

Reply To: FTA011108A

Leslie T. Rogers, Regional Administrator
U.S. Department of Transportation
Federal Transit Administration
201 Mission Street
Suite 2210
San Francisco, CA 94105-1839

Re: Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project APE

Dear Ms. Rogers:

You have provided me with a description of the proposed Area of Potential Effect (APE) for the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project in downtown San Francisco as per 36 CFR 800.4(a) and 800.16(d). The details of the APE and your proposed redevelopment efforts are cited in your letter of October 29, 2001.

The proposed APE appears to be adequate to address both direct and indirect effects created by the project and it's various components and alternatives.

Thank you for considering historic properties during project planning. If you should have any questions, please contact Dana Supernowicz at (916) 653-4533 or dsupe@ohp.parks.ca.gov.

Sincerely,

Dr. Knox Mellon
State Historic Preservation Officer

OPTIONAL FORM 99 (7-90)
FAX TRANSMITTAL
# of pages ▶ 1
To M Pons
From Wiggins
Dept./Agency
Phone #
Fax #
Fax # 650-506-6345
NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Apr-22-02 12:57pm From-FTA 8 +4157442726 T-801 P.01/01 F-712

STATE OF CALIFORNIA – THE RESOURCES AGENCY GRAY DAVIS, *Governor*

**OFFICE OF HISTORIC PRESERVATION**
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September 29, 2003

REPLY TO: FTA011108A

Leslie T. Rogers, Regional Administrator
Federal Transit Administration, Region IX
201 Mission Street, Suite 2210
SAN FRANCISCO CA 94105-1839

Re: Finding of Effects, Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project, City and County of San Francisco.

Dear Mr. Leslie:

Thank you for submitting to our office your August 29, 2003 letter and Finding of Effect (FOE) documentation regarding the proposed Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project in the City and County of San Francisco. The enclosed FOE addresses the Locally Preferred Alternative (LPA) for the proposed project. The LPA consists of three distinct components. In summary, these components include the following elements:

- **Transbay Terminal** - The existing Transbay Terminal will be demolished and a new Transbay Terminal will be constructed to serve as a multi-modal transit/transportation facility at the site of the existing Transbay Terminal at First and Mission Streets. The West Ramp Alternative component of the LPA would remove the existing bus ramps to the Bay Bridge and replace them with a single ramp structure on the west side of the terminal. This structure would support double-stacked ramps, for buses traveling to and from the bridge. The West Ramp Alternative would open up for development land that is currently occupied by the bus ramp on the east side of the terminal.

- **Caltrain Downtown Extension** - Caltrain commuter rail service would be extended from its current San Francisco terminus a 4th and Townsend to a new underground terminus underneath or near the proposed rebuilt Transbay Terminal. Caltrain tracks would enter a tunnel at the existing 4th and Townsend railyard, and would continue below grade under Townsend Street in a cut-and-cover tunnel configuration. The tunnel would run east beneath Townsend Street, then begin to curve northward at Clarence Place (just east of Third Street). From Townsend Street north, the LPA Caltrain Extension component would be in a tunnel configuration, curving under 2nd Street. Cut-and-cover construction would occur on 2nd Street north of Folsom into the basement of the new Transbay Terminal. The Second-to-Main component of the LPA would extend east of the new terminal, in a cut-and-cover configuration - curving south to Main Street to terminate south of Folsom Street.

- Redevelopment - The LPA includes a redevelopment plan and related development projects, including transit-oriented development, on publicly owned land in the vicinity of the new Transbay Terminal. The plan and elated development are intended to assist in financing of the transportation improvements. The redevelopment component of the LPA would include up to 7.6 million square feet of transit-oriented development around the new terminal.

In my letter of May 23, 2003, I concurred with the Federal Transit Administration's (FTA) determination regarding the National Register of Historic Places (NRHP) eligibility of structures evaluated in its Historic Property Survey Report (HPSR). Of those properties evaluated at that time, eighty-five (85) are located within the Area of Potential Effects (APE) for this LPA. Of these properties, 39 buildings or structures have been determined, by consensus, to be eligible for inclusion on the NRHP. There are two historic districts and one City of San Francisco conservation district intersected by the APE: 1) the South End Historic District; 2) the 2nd and Howard Streets Historic District; and 3) the New Montgomery-2nd Street Conservation District. The latter two districts overlap. The proposed project APE, as delineated for the built environment, appears adequate and meets the definition set forth in 36 CFR 800.16(d).

Nineteen known or potential historic-era archeological sites have been identified within or immediately adjacent to the LPA alignments. Details on the types of identified resources that may be present are contained on page 67 of the FOE documentation. FTA is proposing to prepare an archeological Research Design and Treatment Plan that will govern the testing, evaluation, and assessment of project impacts on these resources. If buried materials are unearthed during construction, work in the vicinity of the find would be halted until a qualified archeologist can assess their significance. I would propose that we consult further about the manner in which the undertaking should take into account prospective effects on historic era archeological properties that might be eligible for inclusion on the NRHP.

FTA is seeking my comments on its determination of the effects the proposed project will have on historic properties in accordance with 36 CFR 800, regulations implementing Section 106 of the National Historic Preservation Act. My review of the FOE documentation leads me to make the following comments on the proposed project:

- I concur with FTA's determination that the following properties would be adversely affected by the proposed undertaking due to the demolition of said properties or the removal of structures adjacent to said properties during implementation of the undertaking:
    - 191 2nd Street, San Francisco.
    - 580-586 Howard Street, San Francisco.
    - 165-173 2nd Street, San Francisco.
    - 163 2nd Street, San Francisco.
    - The following contributing elements of the San Francisco-Oakland Bay Bridge
        - 425 Mission Transbay Transit Terminal

- Bridge #34-116F - Upper Deck San Francisco Approaches or North Connector.
- Bridge #34-118L - Upper Deck San Francisco Approaches or Center Ramps.
- Bridge #34-118R - San Francisco Approaches or Lower Deck On-Ramp.
- Bridge #34-119Y - Transbay Terminal Loop
- Bridge #34-120Y - Harrison Street Overcrossing

Although I can concur that the proposed undertaking, as described, will adversely affect the aforementioned properties it remains unclear how extensive the project's effects are to the entirety of the San Francisco-Oakland Bay Bridge, the two historic districts and the conservation district noted above. Is there evidence that either of these districts or the Bay Bridge (as listed in the National Register) are compromised by the removal of contributing properties to the extent that they may no longer retain sufficient integrity to qualify for inclusion on the NRHP? Please provide me, at your earliest possible convenience, any documentation that would clarify the NRHP eligibility status of these district properties once the proposed project is implemented.

Regarding FTA's finding of no adverse effect for the remaining NRHP-eligible properties located within the project APE, I cannot provide comments on this determination. The finding may be of little if any relevance given the overall context of the project's effects on historic properties and does not appear to have sufficient support in the FOE documentation.

I look forward to further consultation focused on a consideration of ways in which any adverse effects of the undertaking on historic properties could be avoided, minimized and mitigated.

Thank you for seeking my comments on your project. I look forward to further consultation with FTA regarding the effects of this undertaking on historic properties. If you have any questions, please contact staff historian Clarence Caesar by phone at (916) 653-8902, or by e-mail at ccaes@ohp.parks.ca.gov.

Sincerely,

Dr. Knox Mellon
State Historic Preservation Officer

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, Governor

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DEC - 2 2003

November 25, 2003

REPLY TO: FTA011108A

Leslie T. Rogers, Regional Administrator
Federal Transit Administration
Region IX
201 Mission Street, Suite 2210
SAN FRANSICO CA 94105-1839

Re: Finding of Effect, Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project, City and County of San Francisco.

Dear Mr. Rogers:

Thank you for submitting to our office your November 14, 2003 letter in response to my September 29, 2003 letter regarding the Federal Transit Administration's (FTA) Finding of Effect (FOE) for the proposed Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project in the City and County of San Francisco. In my September 29, 2003 letter I concurred with FTA's determination that:

- Four (4) architectural properties that were contributing elements to the Second and Howard Streets Historic District would be adversely affected by the proposed project.
- The Transbay Transit Terminal would be adversely affected by the proposed project.
- Five bridge structures (#34-116F, #34-118L, #34-118R, #34-119Y, and #34-120Y) associated with the Upper and Lower Approaches of the San Francisco-Oakland Bay Bridge will be adversely affected by the proposed project.

FTA has noted the absence in my letter of one property, 589-591 Howard Street, from the list of National Register-eligible properties that were noted in the FOE as being adversely affected by the proposed project. Due to this oversight, I have re-examined the FOE documentation and can now concur with FTA's determination that the property located at 589-591 Howard Street will be adversely affected by the proposed project.

In my letter I also raised questions regarding the extent of the project's effects on the entire National Register of Historic Places (NRHP) eligible San Francisco-Oakland Bay Bridge (Bay Bridge) and the aforementioned historic district. Specifically, I raised questions regarding any evidence whether the historic district or the Bay Bridge was compromised by removal of contributing properties to the extent that they may no longer retain sufficient

integrity to qualify for inclusion on the NRHP. FTA has responded to these questions with the following comments:

- It is FTA's opinion that despite the San Francisco-Oakland Bay Bridge East Span Seismic Project and the proposed removal of the aforementioned bridge approaches outlined in this project, the Bay Bridge will retain sufficient integrity to continue to be eligible for the NRHP. What is not clear is whether FTA will support or contest the findings of the Federal Highway Administration's (FHWA) re-evaluation of the Bay Bridge as required under Stipulation III (F)(3) of the 2000 Memorandum of Agreement for the San Francisco-Oakland Bay Bridge East Span Seismic Retrofit Project if that study finds the structure no longer eligible for inclusion on the NRHP. I am pleased to note that FTA is prepared to insert a similar stipulation into a draft MOA addressing the re-examination of the integrity of individual and/or collective historic properties that are adversely affected by this undertaking.

  Regarding the reference in my letter to FTA needing to provide additional information regarding its finding of no adverse effect for 28 of the 39 historic properties (the Rincon Point/South Beach Historic Warehouse Industrial District) located within the project Area of Potential Effects (APE), a re-reading of the FOE documentation leaves me to conclude that FTA did provide sufficient documentation to demonstrate the following regarding its effects findings:

  - 350-360 Townsend and the contributing structures comprising the Rincon Point/South Beach Historic Warehouse Industrial District will not be adversely affected by the introduction of visual or audible elements that would diminish the integrity of the district's significant historic features. This finding will have additional merit if FTA implements its plan to provide for the underpinnings of buildings, where needed, to prevent structural damage during construction of the underground elements of the project. I agree with FTA that the proposed placement of the underground tunnel through this district is such that it will not introduce elements that will adversely affect the property's integrity of design, materials, setting, and association. As a result of this re-examination of the FOE documentation, FTA is not required to provide additional information on its findings.

I am pleased to note that FTA has forwarded a copy of its draft MOA for my review and comment. I will provide comments on its content in a timely manner.

Thank you again for seeking my comments on your project. If you have any questions, please contact staff historian Clarence Caesar by phone at (916) 653-8902, or by e-mail at ccaes@ohp.parks.ca.gov.

Sincerely,

[signature] for

Dr. Knox Mellon
State Historic Preservation Officer

OPTIONAL FORM 99 (7-90)
FAX TRANSMITTAL
# of pages ▸ 2
To M. Pang
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GENERAL SERVICES ADMINISTRATION

United States Department of the Interior
OFFICE OF THE SECRETARY
Washington, DC 20240

TAKE PRIDE IN AMERICA

MAR 9 2004

ER 02/986

Mr. Leslie Rogers
Regional Administrator
Federal Transit Administration
201 Mission Street
San Francisco, California 94105

Dear Mr. Rogers:

This is in response to a request for the Department of the Interior's (Department) review and comment on the administrative draft version of the Final Environmental Impact Statement/Report (EIS/Report) and Section 4(f) Evaluation for the **Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project**, City and County of San Francisco, California. The Department offers the following comments and recommendations for your consideration.

**SECTION 4(f) COMMENTS**

Based on the information provided in the EIS/Report, it is apparent that no public parkland, refuge, or similar site would be affected by either of the action alternatives. Therefore, there are no Section 4(f) considerations with regard to recreational sites.

The National Park Service's Pacific West Regional Office has reviewed this administrative draft document identifying and analyzing a "no action" alternative as well as "action" alternatives for individual components of the proposed project. A locally preferred Stacked Drift Tunneling/West Ramp alternative is also deemed to be the environmentally superior alternative.

In regard to cultural resources, each of the "action" alternatives entails demolition of historic buildings. The locally preferred alternative would have significantly less impact on other listed historic structures in comparison with the Cut and Cover Trench/West Ramp alternative.

Several options were withdrawn from full analysis because they would fall short of meeting the expressed purpose and need for action. None of the withdrawn options offered a feasible and prudent alternative for avoiding the identified effects on cultural resources.

The locally preferred Stacked Drift alternative slates six historic structures for demolition. Three of the resources slated for demolition - Transbay Terminal (425 Mission Street), Bay Bridge Approaches, and Bus Ramps - have been designated contributing resources to the San Francisco-Oakland Bay Bridge, a multi-component property listed on the National Register of Historic Places (NRHP). According to the draft Memorandum of Agreement (MOA) included in the EIS/Report, the California Legislature has granted a specific exemption to State law prohibiting the demolition of historic structures as follows:

"The Legislature thereby approves demolition of the Transbay Terminal building at First & Mission Streets in the City and County of San Francisco, including the associated ramps, for construction of a new terminal at the same location..." (AB 812, 2003).

**SUMMARY COMMENTS**

Our concerns are twofold. First, three of the structures slated for demolition (and not addressed by AB 812) – 165-173 Second Street, 191 Second Street, 580-586 Howard Street – have been designated as contributing resources in the Second & Howard Streets District. Demolition of these three structures in the Second & Howard Streets District also result in isolation of four additional contributing resources in the District, adding to the adverse impact of the undertaking on the integrity of the District. While it is clear that the proposed undertaking will adversely affect all six properties, not enough information has been provided in the EIS/Report materials to determine the overall effect of the proposed demolition on the integrity of the Second & Howard Streets District or the Bay Bridge District (as listed on the NRHP).

Second, the MOA Section III (F) stipulates that a reevaluation of the Bay Bridge District shall occur within 180 days of completion of the undertaking to determine whether the nomination should be amended or whether the bridge no longer qualifies for listing and should be removed from the NRHP. The MOA states that the Transbay Joint Powers Administration will conduct the evaluation in consultation with the SHPO. A similar clause is not included for the Second & Howard Street Historic District in the Mitigation Section IV of the MOA. From the information provided, it is unclear whether an evaluation was completed to assess the potential impact of the proposed undertaking on the Second & Howard Street Historic District, or if not, what was the basis for this result. If an evaluation has not been done, our recommendation would be to complete this process for the Second & Howard Street District.

The Department of the Interior has no objection to Section 4(f) approval of this project, provided the measures to minimize harm mentioned above are included in the project plans and implementation. Because this Department has a continuing interest in this project, we are willing to cooperate and coordinate with you on a technical assistance basis in further project evaluation and assessment. For additional information regarding our comments, please contact Ms. Elaine Jackson-Retondo, PhD, Cultural Resources, National Park Service, Oakland, California; telephone 510-817-1428.

Sincerely,

Willie R. Taylor

Willie R. Taylor
Director, Office of Environmental Policy
and Compliance

cc:
Ms. Marie Pang
Caltrain
Peninsula Corridor Joint Powers Board
1250 San Carlos Avenue
P.O. Box 3006
San Carlos, CA 94070-1306

# APPENDIX E: BIBLIOGRAPHY

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## APPENDIX F:

## URBAN FORM PROGRAM
## DRAFT TRANSBAY REDEVELOPMENT PROJECT AREA
## DESIGN FOR DEVELOPMENT VISION

*The following is a summary of the urban form program as contained in the Draft Transbay Redevelopment Project Area Design for Development Vision released by the San Francisco Redevelopment Agency in August 2003.*

*As shown in F-1, the draft vision includes an urban form program for the proposed Project Area designed to preserve sunlight, views, and open space. While the "full build" alternative includes approximately 4,700 residential units, this level of development would create a virtual wall of residential towers along Folsom Street and north of Folsom Street between Main and Beale Streets. Based on community input from the public workshops, the number of residential towers was significantly reduced and would include fewer, taller towers surrounded by low-rise development between four and eight stories in height. The spacing between the towers is intended to protect sunlight, open space, and views within the proposed Project Area.*

*The draft program includes approximately 3,200 new residential units on the publicly owned development parcels, including several smaller, underutilized adjacent parcels, as follows (numbers and letters correspond to Figure F-1):*

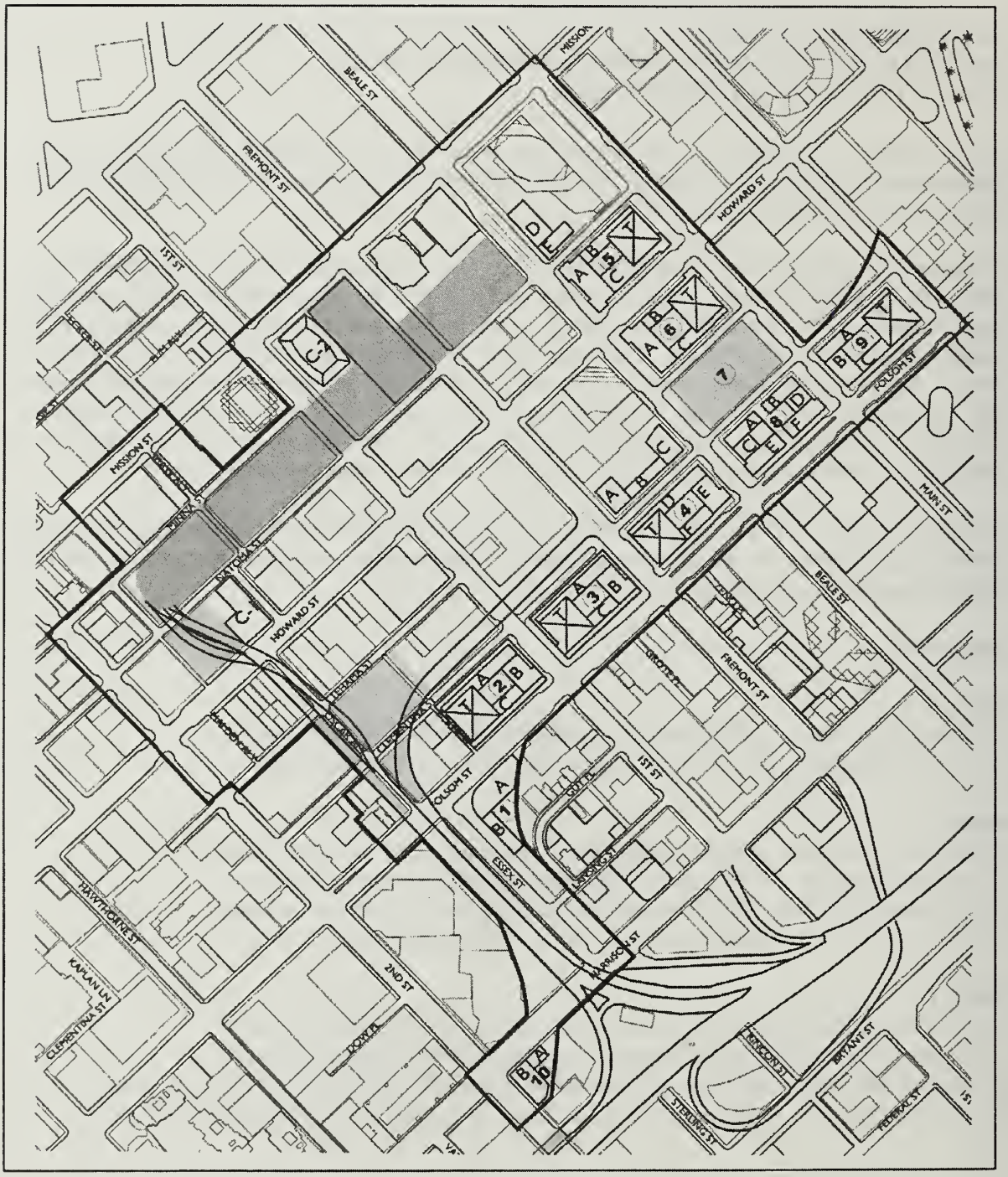
***Residential.***

***Block 1***
*A – 8-story (80-foot), 88,000-square-foot building with 75 residential units*
*B – 4-story (40-foot), 18,000-square-foot building with 16 residential units*

***Block 2***
*T – 40-story (400-foot), 440,000-square-foot tower with 353 residential units*
*A – 4-story (40-foot), 27,000-square-foot building with 23 residential units*
*B – 16-story (160-foot), 88,000-square-foot building with 75 residential units*
*C – 6-story (60-foot), 19,000-square-foot building with 16 residential units*

***Block 3***
*T – 55-story (550-foot), 605,000-square-foot tower with 485 residential units*
*A – 4-story (40-foot), 27,000-square-foot building with 23 residential units*
*B – 8-story (80-foot), 43,000-square-foot building with 34 residential units and retail space*
*C – 6-story (60-foot), 19,000-square-foot building with 13 residential units and retail space*

**Figure F-1: Draft Urban Form Plan for Redevelopment Area**



***Block 4***
*T – 30-story (300-foot), 330,000-square-foot tower with 265 residential units*
*A – 8-story (80-foot), 39,000-square-foot building with 34 residential units*
*B – 4-story (40-foot), 17,000-square-foot building with 14 residential units*
*C – 8-story (80-foot), 45,000-square-foot building with 38 residential units*
*D – 4-story (40-foot), 28,000-square-foot building with 24 residential units*
*E – 8-story (80-foot), 45,000-square-foot building with 34 residential units and retail space*
*F – 6-story (60-foot), 15,000-square-foot building with 11 residential units and retail space*

***Block 5***
*T – 55-story (550-foot), 605,000-square-foot tower with 485 residential units*
*A – 6-story (60-foot), 60,000-square-foot building with 51 residential units*
*B – 4-story (40-foot), 19,000-square-foot building with 16 residential units*
*C – 8-story (80-foot), 64,000-square-foot building with 54 residential units*
*D – 8-story (80-foot), 58,000-square-foot building with 49 residential units*
*E – 4-story (40-foot), 16,000-square-foot building with 15 residential units*

***Block 6***
*T – 45-story (450-foot), 495,000-square-foot tower with 397 residential units*
*A – 6-story (60-foot), 56,000-square-foot building with 48 residential units*
*B – 6-story (60-foot), 30,000-square-foot building with 26 residential units*
*C – 4-story (40-foot), 19,000-square-foot building with 16 residential units*

***Block 8***
*A – 4-story (40-foot), 16,000-square-foot building with 14 residential units*
*B – 4-story (40-foot), 16,000-square-foot building with 14 residential units*
*C – 6-story (60-foot), 15,000-square-foot building with 12 residential units and retail space*
*D – 8-story (80-foot), 23,000-square-foot building with 17 residential units and retail space*
*E – 8-story (80-foot), 41,000-square-foot building with 30 residential units and retail space*
*F – 16-story (160-foot), 82,000-square-foot building with 65 residential units and retail space*

***Block 9***
*T – 30-story (300-foot), 330,000-square-foot tower with 263 residential units and retail space*
*A – 4-story (40-foot), 29,000-square-foot building with 24 residential units*
*B – 8-story (80-foot), 39,000-square-foot building with 33 residential units and retail space*
*C – 6-story (60-foot), 21,000-square-foot building with 16 residential units and retail space*

***Block 10***
*A – 6-story (60-foot), 12,000-square-foot building with 10 residential units*
*B – 8-story (80-foot), 52,000-square-foot building with 44 residential units*

*These residential units are assumed to be approximately 60 percent for-sale and 40 percent rental and would include a variety of unit types and sizes with an average unit size of 1,000 square feet. Ground-floor residential units would be designed as individual townhouses, with entrances elevated at least 3 feet above street level and set back from the sidewalk to provide space for landscaping and other sidewalk amenities. Parking for all new residential development would be required to be below grade, with a maximum of one parking space per residential unit. Developers would be required to separate the cost of parking spaces from the cost of residential units and provide spaces for interested car-sharing programs on site. The Final Design for Development will include a set of standards and guidelines for residential development in the new Transbay neighborhood.*

*It will be the policy of the Redevelopment Agency that 35 percent of the new residential units built within the proposed Project Area will be affordable. At least 25 percent of all new residential units developed within the Project Area is intended to be affordable to, and occupied by, households whose incomes do not exceed 60 percent of the area median income, and an additional 10 percent of all dwelling units developed within the Project Area are intended to be affordable to, and occupied by, households whose incomes do not exceed 120 percent of the area median income. These affordable units are assumed to be a combination of stand-alone, 100 percent affordable housing developments, such as affordable senior housing, and "inclusionary" units, or affordable units built within market-rate developments. At least 15 percent of all units in new market-rate developments are intended to be "inclusionary" units.*

***Office.*** *The program includes new office development on two publicly owned parcels in the proposed Project Area, as shown on Figure 5.22-28. The offices are configured as follows (numbers and letters correspond to Figure 2.2-28):*

***Block C-1:***
*16-story (160-foot), 200,000-square-foot office building*

***Block C-2:***
*52-story (550-foot), 1,040,000-square-foot building with 565,000 square feet of office space and a hotel*

***Hotel.*** *The program includes new hotel development on the publicly owned parcel just north of the new Transbay Terminal. This hotel would serve high-speed rail passengers using the new Terminal as well as the larger downtown area. The hotel on Block C-2 would occupy 475,000 square feet of the 52-story building on the site.*

***Retail.*** *The program includes approximately 40,000 square feet of ground-floor retail space concentrated in the residential area along Folsom Street. This new retail space will serve future residents of Transbay as well as existing residents in Rincon Hill.*

***Public Improvements***

*Because one of the purposes of the Redevelopment Area is to serve regional commuters with easy access to the Bay Bridge, the proposed Project Area currently does not offer pedestrians a pleasant experience. To transform the area into a livable residential neighborhood, the Draft Design for Development document also includes improvements to the streetscape and open space for area residents and pedestrians. Four main types of public improvements are included: (1) neighborhood parks, (2) landmark plazas (3) pedestrian-oriented alleys, and (4) widened sidewalk zones.*

*The most prominent of the proposed public improvements is the addition of widened sidewalks to improve the pedestrian experience along all the streets in the area, providing connections to and from downtown, the waterfront, South Beach and Yerba Buena. The sidewalks along Beale, Main and Spear Streets are proposed to be widened to provide usable open space for the area's residents. In addition, it is proposed that the neighborhood be served with new parks programmed with various uses. Together these parks total 126,800 square feet.*

***Neighborhood Parks.*** *Two primary target zones for neighborhood parks are those zones where new residential development housing would be focused: Block 7, the publicly owned parcel framed by Main, Beale and Folsom Streets; and the Mixed Use area around Second Street. Each of these zones sites has been identified for a major new public park. While these will not be large enough to accommodate ball fields or other large-scale active recreation, they would provide neighborhood open space similar to that found in nearby San Francisco neighborhoods.*

*The park identified just north of Folsom, bounded by Main and Beale Streets is similar in size to Sidney Walton Park in the Golden Gateway area. Like Sidney Walton Park, this park could be well landscaped and frequented by nearby residents and workers. The park would also be similar to Washington Square in North Beach that accommodates informal recreation and passive activities.*

*The site configuration for the parks located in the mixed-use district will require additional study, as they are dependent on the configuration of the bus ramps leading to the Transbay Terminal. Given the locations of these ramps, it may be possible to provide a passive or informal park such as South Park in this area for neighborhood use, as well as more active recreation uses adjacent to or under the freeway ramps (e.g., handball or basketball courts).*

*Tower locations and heights have been carefully defined to minimize shading of parks and expanded streetscapes during the mid-day hours throughout the year.*

***Landmark Plazas.*** *The primary opportunity and logical site for a landmark public plaza is on the north and south of the primary Transbay Terminal edifice, the east-west spine that will house the primary vehicular circulation for the terminal. To the north and south of this transportation facility will be the primary access points to the Terminal, where large numbers of people would enter and exit daily. To the south, an office building is permitted but not yet built. If plans change for this property, consideration could be give to a larger plaza leading to the south terminal entries. On the north of the Terminal, depending on its ultimate configuration and associated development, an opportunity for a major public space, outdoors or enclosed like a "winter garden," exists.*

***Alleys.*** *The proposed program includes new alleys as well as extensions to existing alleys throughout the Project Area, allowing for better pedestrian circulation throughout the neighborhood. Pedestrian alleys can have a high level of pedestrian activity, and can be improved with special paving, lighting, plantings, and furniture. Some alleys could be closed to vehicular traffic at lunch or for special occasions to allow the entire alley to become a pedestrian space, and to allow it to accommodate outdoor dining, etc. In some portions of some alleys, access to parking garages and service docks and the movements of delivery vehicles will limit the ability to create these pedestrian zones.*

***Widened Sidewalk Zones.*** *The street environment is poor throughout the Transbay district, with few street trees, little in the way of pedestrian amenities, sidewalks that are cracked or in disrepair, and no pedestrian street lighting. Significant improvements to the sidewalk environment appear necessary and are planned as a part of the redevelopment of the area.*

*Conditions in the Transbay area represent a unique opportunity to improve the public realm of open space and the pedestrian environment through a focus on the sidewalk areas. Wide streets exist throughout the neighborhood. While this width is needed in some locations to accommodate the volumes of traffic associated with commute movements into and out of the city, this width does not appear to be necessary on other streets, and excess street capacity appears to exist. This capacity could be put to use through widened sidewalks, returning more space to the pedestrian from the automobile zone.*

*The widened sidewalks could serve two roles: (1) as improved linkages throughout the area but in particular to the terminal itself for the high volumes of pedestrian traffic that is expected as the area redevelops, and (2) as usable public open space on certain streets where adequate room exists to allow more active recreation uses. Following is a discussion of opportunities to create specially widened sidewalks in three zones.*

***Folsom Street*** *has been identified in the past as a location for a special pedestrian right-of-way that might act as the center of the new neighborhood and provide an active link to the waterfront along the Embarcadero. The analysis of traffic volume requirements shows that four travel lanes are required: three eastbound and one westbound. In addition, this street is anticipated to include parking on both sides to support retail uses*

*and to buffer pedestrians from traffic. An eastbound bicycle lane is also anticipated. On the north side of the street, a 15-foot setback is proposed to be required throughout the proposed Project Area. Two alternative configurations of Folsom Street are described below.*

*In the first configuration, sidewalks would be improved on both sides of the street. On the north side, a 15-foot setback, combined with a seven-foot sidewalk zone, would provide a generous sidewalk area on the sunny side of the street – large enough for extensive plantings and furnishings or sidewalk seating for cafes and restaurants. The southern edge sidewalk is a typical neighborhood scale sidewalk and could be furnished with lighting, street trees, and site furnishings such as benches.*

*In the second configuration, a median would be added between the eastbound and westbound lanes. This would leave a 17-foot sidewalk on the north side (made possible by the 15-foot setback), which is still a generous sidewalk allowing for extensive landscaping and furnishings on this sunny side. The median would provide an opportunity to make this street distinctive among Transbay-area streets, as there is inadequate width on any other streets to provide a continuous median such as this.*

*Significant portions of* ***Main, Beale, and Spear*** *Streets carry the lowest vehicular traffic volumes in the area. In fact there is excess capacity within the vehicular right-of-way for projected traffic volumes. This makes it possible to use some of the street width for a pedestrian sidewalk zone.*

*Widening of sidewalks on these streets would be important given the significant number of housing units that would have access from or be adjacent to these streets, and could therefore enjoy the benefits of adjacent improved sidewalks. These streets are also the primary connectors from the eastern portion of the financial district to the South Beach waterfront area, where major open space amenities and public destinations are located, e.g., Pacific Bell Park. Since these streets connect through to the waterfront (whereas no street to the west does until you reach Second Street), and since they are also nearly flat, they appear to be prime pedestrian priority corridors.*

*The Draft Design for Development would improve the street in an asymmetrical fashion. This would result in sidewalks of as much as 32 feet on one side, with 15 feet on the other. Parking would remain on both sides of the street, and adequate width would be provided for bicycle routes. The 32-foot wide sidewalk would create a new prototype for open space in San Francisco, where the sidewalk would be so wide that it would constitute linear open space, and could be improved with small-scale active recreation uses. These might include small tot lots, bocce ball courts, and chessboards, as well as the uses that could be accommodated on a normally wide sidewalk, such as outdoor dining.*

***Other Streets:*** *Options are being explored for widening the sidewalk environment of other Transbay area streets. However, projected traffic volumes on many streets are such that only limited improvements would be possible – none of the scale and extent as those proposed for Folsom, Main, Beale and Spear Streets.*

# Memorandum of Agreement

among the

## Federal Transit Administration, and California State Historic Preservation Officer

for the

Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project in San Francisco County, California

WHEREAS, the Federal Transit Administration (FTA) has under consideration construction of a new multi-modal Terminal on the site of the present Transbay Transit Terminal, extension of the Peninsula Corridor Service (Caltrain) from its current San Francisco terminus at Fourth and Townsend Streets to a new underground terminus beneath the new Terminal, and establishment of a Redevelopment Area Plan with related development projects, including transit-oriented development on publicly-owned land in the vicinity of the new multi-modal Terminal (Undertaking) as proposed by the Transbay Joint Powers Authority (TJPA), the City and County of San Francisco (CCSF), the Peninsula Corridor Joint Powers Board (JPB), and the San Francisco Redevelopment Agency (SFRA); and

WHEREAS, on March 28, 2003, the TJPA selected a Locally Preferred Alternative (LPA) for this Undertaking that includes the West Ramp Transbay Terminal Alternative, Full Build Redevelopment Alternative; and Second-to-Main Tunneling Alternative; and

WHEREAS, FTA is the lead federal agency for this Undertaking, pursuant to the National Environmental Policy Act (NEPA) and the co-lead agencies are the CCSF, JPB, and the SFRA;

WHEREAS, the TJPA, as a Responsible Agency, intends to become the project sponsor, a grantee for federal grant receipt purposes, and the recipient to FTA assistance; and

WHEREAS, the California Department of Transportation (Department) has indicated that it will transfer title to the historic property known as the Transbay Transit Terminal, which is a component of the San Francisco – Oakland Bay Bridge (Bay Bridge), a multi-component structure that is listed on the National Register of Historic Places (NRHP), to TJPA, after receipt of satisfactory proof that FTA has issued a Record of Decision pursuant to NEPA for construction of the Undertaking, and

WHEREAS, this Undertaking will adversely affect historic properties listed or eligible for listing on the NRHP, including components of the Bay Bridge and the Second and Howard Streets Historic District, and may have effects on archaeological properties that have not yet been identified; and

WHEREAS, the Bay Bridge East Span Seismic Safety Project in San Francisco and Alameda counties is a separate undertaking from the subject Undertaking; and

WHEREAS, FTA has consulted with the California State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation (ACHP) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, FTA, TJPA, CCSF, JPB, SFRA have consulted with Department; the City of Oakland, the San Francisco Architectural Heritage; the San Francisco Planning & Urban Research Association (SPUR); the National Park Service (Western Regional Office); the National Trust for Historic Preservation; the American Institute of Architects Preservation Committee; San Francisco Beautiful; Transbay Citizens' Advisory Committee; the Oakland Heritage Alliance; the San Francisco Landmarks Preservation Advisory Board; and San Francisco Tomorrow, about the Undertaking and its effects on historic properties, and have taken all comments received from these parties into account; and

WHEREAS, the California Legislature has considered the importance of proceeding with the Transbay Transit Terminal project and has granted a specific exemption to State Law prohibiting the demolition of historic structures with the following language: "the Legislature hereby approves demolition of the Transbay Terminal building at First and Mission Streets in the City and County of San Francisco, including its associated ramps, for construction of a new terminal at the same location, designed to serve Caltrain in addition to local, regional, and intercity bus lines, and designed to accommodate high-speed passenger rail service." (AB 812, 2003);

NOW, THEREFORE, FTA and SHPO agree that the Undertaking will be implemented in accordance with the following stipulations in order to take into account the effect of the Undertaking on historic properties.

## STIPULATIONS

### I. Applicability of Stipulations

If FTA provides funding assistance or a loan guarantee for the Undertaking, FTA will ensure that the TJPA implements the following stipulations, which are applicable to the Locally Preferred Alternative (LPA).

### II. Professional Standards

All activities regarding history, historic preservation, historical archaeology and prehistoric archaeology that are carried out pursuant to this Agreement will be carried out by or under the direct supervision of persons meeting, at a minimum, the Secretary of the Interior's professional qualifications standards (48 FR 44738-9) in these disciplines.

### III. Mitigation of Effects on Components of the San Francisco-Oakland Bay Bridge (Bay Bridge)

#### A. Permanent Interpretive Exhibit at the Terminal

TJPA will direct the design and engineering team for the Undertaking to integrate into the design of the new terminal a dedicated space for a permanent interpretive exhibit. The interpretive exhibit will include at a minimum, but is not necessarily limited to: plaques or markers, a mural or other depiction of the historic terminal, and Key System, or other interpretive material.

TJPA will consult with Department regarding the availability of historical documentary materials and the potential use of salvaged items from the existing Transbay Transit Terminal for the creation of the permanent interpretive display of the history of the original Transbay Transit Terminal building and its association with the San Francisco-Oakland Bay Bridge and the potential salvaged items from the existing Terminal.

Department will assist TJPA in planning the scope and content of the proposed interpretive exhibit. In addition, TJPA will also invite the Oakland Heritage Alliance, the San Francisco Architectural Heritage, the California State Railroad Museum, and the Western Railway Museum to participate. TJPA, while retaining responsibility for the development of the exhibit, will consider, jointly with Department, the participating invitees' recommendations when finalizing the exhibit design. TJPA will produce, install, and maintain the exhibit.

TJPA will also consult with the City of Oakland about its interest in having a similar interpretive exhibit in the East Bay. If agreement is reached prior to completion of final design of the Terminal, TJPA will provide and deliver exhibit materials to a venue provided by the City of Oakland.

**B. Salvage**

TJPA, in consultation with Department, will identify elements of the existing Transbay Transit Terminal that are suitable for salvage and interpretive use in the exhibit in the new Terminal or in museums. Within two years of signing of this agreement, TJPA will offer these items to San Francisco Architectural Heritage, the California State Railroad Museum, Sacramento, the Western Railway Museum, the Oakland Museum, and any other interested parties. Acceptance of items by interested parties must be completed at least 90 days prior to demolition of the Transbay Transit Terminal. TJPA will remove the items selected in a manner that minimizes damage and will deliver them with legal title to the recipient. Items not accepted for salvage or interpretive use will receive no further consideration under this agreement.

**C. Oakland Museum of California Exhibit**

TJPA will consult with Department and the Oakland Museum about contributing to Department's exhibit at the Oakland Museum relating to the history and engineering of the major historic state bridges of the San Francisco Bay Area. TJPA will propose contributions to such an exhibit that may include an interpretive video including the history of the Transbay Transit Terminal and the Key System. Components to such an exhibit may include photographs, drawings, videotape, models, oral histories, and salvaged components from the terminal. In addition, TJPA will assist the Museum by contributing to the cost of preparing and presenting the exhibit, interpretive video, as well as the costs of an exhibit catalog or related museum publication in conjunction with the exhibit, in a manner and to the extent agreed upon by TJPA, Department, and the Oakland Museum of California if consultation results in agreement between TJPA and Oakland Museum prior to demolition of the existing Transbay Transit Terminal. TJPA has established a maximum budget of $50,000.00 for the Oakland Museum of California exhibit and the interpretive video.

**D. Documentation**

Prior to the start of any work that would have an adverse effect on historic properties, TJPA will consult with the California SHPO, to ensure that the Transbay Transit Terminal has been adequately recorded by past efforts. Collectively, these past studies, which include Department's past recordation of a series of remodeling and seismic retrofit projects that have occurred since 1993, may adequately document the building, making Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) documentation unnecessary. In addition, TJPA, assisted by Department, will seek to obtain the original drawings of the Transbay Transit Terminal by the architect Timothy Pflueger. If the drawings cannot be copied and included in the documentation, then TJPA will consult with SHPO regarding recordation level and specifications for completing additional documentation. When the SHPO finds the documentation to be adequate, then TJPA will compile this documentation into a comprehensive record. All

documentation will be submitted to SHPO and Department Headquarters Library with a xerographic copy to the Department District 4 Office. TJPA will contact the following repositories to inquire if they would like to receive a xerographic copy of the documentation: History Center at the San Francisco Public Library, San Francisco Architectural Heritage, the Oakland History Room of the Oakland Public Library, the Oakland Museum of California, and the Western Railway Museum. TJPA will ensure that these records are accepted by SHPO prior to demolition of the Transbay Transit Terminal.

### E. Reevaluation of the Bay Bridge

Within 180 days after FTA determines that the Undertaking has been completed, TJPA, in consultation with FTA and SHPO, will re-revaluate the Bay Bridge, a property listed on the NRHP, and determine whether the National Register nomination should be amended or whether the bridge no longer qualifies for listing and should be removed from the National Register. As appropriate, TJPA will prepare and submit to the FTA and SHPO either an amended nomination or petition for removal, to be processed according to the procedures set forth in 36 CFR Part 60(60.14 and 60.15).

## IV. Mitigation of Effects on Second and Howard Streets Historic District and Protective Measures for Rincon Point/South Beach Historic Warehouse Industrial District

### A. Protective Measures

TJPA, in consultation with the owners of historic properties immediately adjoining the construction sites, will develop and implement measures to protect the contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District from damage by any aspect of the Undertaking. Such measures will include, but are not necessarily limited to those identified in Appendix A to this Agreement.

### B. HABS/HAER Documentation

Prior to the start of any work that would have an adverse effect on historic properties, TJPA will ensure that the three historic properties that will be demolished are recorded in accordance with HABS/HAER standards, as appropriate. These buildings are:

- 191 2nd Street, (APN: 3721-022),
- 580-586 Howard Street, (APN: 3721-092 through 3721-106), and
- 165-173 2nd Street, (APN: 3721-025).

TJPA will contact the HABS/HAER branch of the NPS to obtain guidance regarding the level of recordation and specifications for completing the documentation. All documentation will be submitted to SHPO, with xerographic copies to the History Center at the San Francisco Public Library, San Francisco Architectural Heritage, and the Oakland History Room of the Oakland Public Library. TJPA will ensure that these HABS/HAER records are accepted by NPS prior to carrying out any other treatment.

### C. Repair of Inadvertent Damage

TJPA will ensure that any damage to contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District resulting from the Undertaking will be repaired in accordance with the Secretary of the Interior's Standards for Rehabilitation. The condition of the contributing properties will be photographed prior to the

start of the Undertaking to establish the baseline condition for assessing damage. To record these existing conditions, TJPA will consult with property owner(s) about the appropriate level of photographic documentation of building interiors and exteriors. A copy of this photographic documentation will be provided to the property owner(s), and will be retained on file by TJPA. If repair of inadvertent damage is necessary, TJPA will submit plans to the SHPO for review and comment to ensure conformance with the Secretary of the Interior's Standards for Rehabilitation.

### D. Reevaluation of the Second and Howard Streets Historic District

Within 180 days after FTA determines that the Undertaking has been completed, TJPA, in consultation with FTA and SHPO, will re-revaluate the Second and Howard Streets Historic District and determine whether the National Register nomination should be amended or whether the district no longer qualifies for listing and should be removed from the National Register. As appropriate, TJPA will prepare and submit to the FTA and SHPO either an amended nomination or petition for removal, to be processed according to the procedures set forth in 36 CFR Part 60(60.14 and 60.15).

## V. Mitigation of Effects on Archaeological Properties and Development and Implementation of a Treatment Plan for Archaeological Resources

TJPA or its consultants will carry out, in consultation with the JPB and CCSF, the following activities regarding mitigation of potential archaeological resource impacts.

### A. Research Design/Treatment plan development

The TJPA will have a comprehensive Research Design/Treatment Plan for archeological resources prepared by a qualified consultant. The Research Design/Treatment Plan will be consistent with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into account the ACHP publication, Treatment of Archaeological Properties: A Handbook (ACHP 1980), and SHPO guidelines.

### B. Research Design/Treatment Plan Specifics

The Research Design/Treatment Plan will include, at a minimum:

i An Historical Context for the Area of Potential Effects for Archaeological Resources (APEAR). The Historical Context will present prehistoric and historic-era overviews of the project area. The Historical Context should incorporate data developed in the Archaeological Research Design and Treatment Plan for SF-480 Terminal Separation Rebuild (Praetzellis and Praetzellis, 1993) and the San Francisco-Oakland Bay Bridge, West Approach Replacement: Archaeological Research Design and Treatment Plan (Ziesing, 2000) for the portions of the APEAR within the scope of these documents.

ii A Research Context for the APEAR. The Research Context will identify expected archeological property types and develop research themes, questions, and data needs. To the extent applicable to expected property types, the Research Context will incorporate the research framework developed in the Revised Historical Archaeology Research Design for the Central Freeway Replacement Project (Thad M. Van Bueren, Mary Praetzellis, Adrian Praetzellis, Frank Lortie, Brian Ramos, Meg Scantlebury and Judy D. Tordoff). )

iii Testing/Data Recovery Plan that will specify, at minimum:

- The properties or portion of properties where evaluation and/or data recovery are to be carried out;
- The properties, if any, that will be affected by the Undertaking but for which no data recovery will be carried out;
- The manner in which inadvertent discoveries will be treated;
- The methods to be used for data recovery, with an explanation of their relevance to the research questions/themes;
- The methods to be used in cataloguing, analysis, data management, and dissemination of data;
- The proposed disposition of recovered materials and records, including discard and deaccession;
- The manner in which any human remains and associated/unassociated funerary objects, including those of Native American or Native Hawaiian origin, will be treated;
- The security procedures to be undertaken to protect the archeological testing/data recovery site from vandalism, theft, or unintended damage;
- The final report summarizing, describing and interpreting the results of testing/data recovery;
- The measures to be undertaken to ensure curation of recovered data determined to have appropriate research potential.
- Research Design/Treatment Plan Review

TJPA will submit the Research Design/Treatment Plan to all parties to this Agreement for a thirty (30) calendar day review following receipt of the Plan. If any party fails to submit their comments within thirty (30) days, TJPA may assume that party's concurrence with the Research Design/Treatment Plan. TJPA will take any review comments into account, revise the Research Design/Treatment Plan accordingly, and will notify any party whose comments were not incorporated into the Plan.

**C. Notification**

TJPA will promptly notify the SHPO, FTA, and Department as appropriate, if any properties are found that meet the conditions for eligibility for inclusion in the NRHP.

**D. Report Standards and Dissemination**

TJPA will ensure that all reports from implementation of the Research Design/Treatment Plan meet contemporary professional standards and the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37). Copies of all final reports will be provided to the SHPO, the Northwest Information Center at Sonoma State University, the Federal Transit Administration, Department, and the Environmental Review Officer of the CCSF.

**E. Confidentiality**

The signatories to this Agreement acknowledge that historic properties covered by this Agreement are subject to the provisions of § 304 of the National Historic Preservation Act of 1966 and § 6254.10 of the California Government Code (Public Records Act), relating to the disclosure of archeological site information and, having so acknowledged, will ensure that all actions and documentation prescribed by this Agreement are consistent with § 304 of the National Historic Preservation Act of 1966 and § 6254.10 of the California Government Code.

## VI. Annual Report

TJPA will prepare an annual report describing the status of its efforts to comply with the mitigation measures set forth in Stipulations III through V of this Agreement. The annual report will be prepared following the end of the each fiscal year (July 1 to June 30) and will be distributed by TJPA to all of the signatories to this Agreement by July 30 of each year, until TJPA determines that the applicable mitigation measures set forth in Stipulations III through V inclusive, of this Agreement have been completed.

## VII. Amendments, Legal Compliance, Termination, and New Agreement

### A. Amendments

If any signatory to this Agreement determines that an amendment to its terms should be made, the signatory will immediately consult with the other signatories to this Agreement pursuant to 36 CFR 800.6 (c)(7). This Agreement may be amended only upon written concurrence of all signatory parties.

### B. Legal Compliance

All signatories to this agreement shall comply with all applicable laws and regulations of the State of California and the United States.

### C. Termination

If the signatory parties to this Agreement do not reach consensus on amendment(s) as provided for in this stipulation, FTA and SHPO may terminate it. The party terminating the Agreement will in writing provide all other signatories with an explanation of the reasons for termination. If the Agreement is not amended or terminated, the Agreement will remain in effect as originally executed, and FTA will notify the other signatories that the attempt to reach consensus on amendment(s) was unsuccessful.

### D. Action Following Termination

If this Agreement is terminated by FTA or SHPO for any reason, and FTA determines that the Undertaking will proceed, FTA will execute a new Memorandum of Agreement with the signatories under 36 CFR 800.6.

## VIII. Dispute Resolution

Should any signatory to this Agreement object to the manner in which the terms of this Agreement are implemented, or to any documentation prepared in accordance with and subject to the terms of this Agreement, FTA will consult further with the objecting party to resolve the objection. If FTA determines within fourteen (14) days of receipt that such objection cannot be resolved, FTA will forward all documentation relevant to the dispute to the ACHP, including FTA's proposed response to the objection. Within thirty (30) days after receipt of all pertinent documentation, the ACHP will:

- Advise FTA that it concurs in FTA's proposed response, whereupon FTA will respond to the objection accordingly; or

- Provide FTA with recommendations which FTA will take into account in reaching a final decision regarding the dispute.

Any ACHP comment provided in response to FTA's request will be taken into account by FTA with reference only to the subject of the dispute. The signatories' responsibilities to carry out all actions under this Agreement that are not the subject of the dispute will remain unchanged. FTA may authorize TJPA to implement that portion of the Agreement which is subject to dispute after receiving and taking into account, any ACHP comments issued in accordance with this stipulation. FTA's decision regarding resolution of the dispute will be final.

If the ACHP fails to comment within the time period specified in this stipulation, FTA may authorize TJPA to implement that portion of the Agreement which is subject to dispute in accordance with FTA's proposed response to the objection as submitted to the ACHP, and after taking into account any SHPO or ACHP comments. FTA's decision regarding resolution of the dispute will be final.

## IX. Public Objections

If any member of the public objects to the manner in which the provisions of this Agreement are implemented, FTA shall immediately notify the other parties in writing of the objection and take the objection into account. FTA shall consult with the objecting party and, if the objecting party so requests, with any or all of the other signatories, for no more than thirty (30) calendar days. Within fourteen (14) calendar days following closure of the consultation period, FTA will render a decision regarding the objection and notify all parties of this decision in writing. In reaching a decision, FTA will take comments from all parties into account. No provision of this stipulation will preclude FTA from continuing to implement any provision of the Agreement that is subject to public objection.

## X. Duration

### A. Reconsideration

If FTA determines that construction of the Undertaking has not been initiated within ten years following execution of this Agreement, the signatories shall consult to reconsider its terms. Reconsideration may include continuation of the Agreement as originally executed, amendment, or termination in accordance with Stipulation VII.

### B. Terms Fulfilled

This Agreement will be in effect through FTA's implementation of the Undertaking, and will terminate and have no further force or effect when FTA, in consultation with the other signatories, determines that the terms of this Agreement have been fulfilled in a satisfactory manner. FTA will provide that other signatories with written notice of its determination and of termination of this Agreement.

Execution and implementation of this Agreement is evidence that FTA has afforded the ACHP a reasonable opportunity to comment on the Undertaking and the effect of the Undertaking on historic properties, and have themselves taken into account the effect of the Undertaking on historic properties.

**Federal Transit Administration**

By: _____ Date: _____
Title:

**California State Historic Preservation Officer**

By: _____ Date: _____
Title:

## Invited Concurring Parties:

**Transbay Joint Powers Authority**

By: _____ Date: _____
Title:

**City and County of San Francisco**

By: _____ Date: _____
Title:

**Peninsula Corridor Joint Powers Board**

By: _____ Date: _____
Title:

**California Department of Transportation**

By: _____ Date: _____
Title:

# Appendix A: Protective Measures:

Following are mitigation measures to be implemented to protect properties eligible for on in the National Register of Historic Places. The measures described would be implemented by a combination of construction contract specifications, drawings, and provisions, as well as public affairs programs. TJPA and JPB staff would be assigned to work directly with the public to provide project information and to resolve construction-related problems. The TJPA and JPB will work with community residents, elected officials, local businesses, and community organizations to tailor the mitigation program to best meet community needs. Contractors will be monitored to assure that mitigation measures are met.

## I. Preconstruction Activities

- **Undertake building data survey.** A pre-construction structural survey would be completed to determine the integrity of existing buildings adjacent to and over the proposed extension. This survey would be used to finalize detailed construction techniques along the alignment and as the baseline for monitoring construction impacts during and following construction. During construction, the TJPA and JPB would monitor adjacent buildings for movement and, if movement is detected, take immediate action to control the movement.

- **Complete detailed geotechnical investigation.** During final design, additional sampling (drilling and core samples) and analyses of subsurface soil/rock conditions would be used to detail and finalize the excavation and its support system to be used in the retained cut, cut-and-cover and tunnel portions of the extension. Current data, including subsurface sampling conducted in 1995 and 1996 for the 1997 Caltrain DEIS/DEIR have been used to identify the proposed construction techniques presented in the following sections, which form the basis for the impact analysis that follows in Section 5.21.

## II. General Construction Measures

- **Provide signage.** The TJPA and JPB would work with establishments affected by construction activities. Appropriate signage would be developed and displayed to direct both pedestrian and vehicular traffic to businesses via alternate routes.

- **Install level deck.** Decking at the under-street cut-and-cover sections would be installed flush with the existing street or sidewalk levels.

- **Provide for efficient sidewalk design and maintenance.** Wherever feasible, sidewalks would be maintained at the existing width during construction. Where a sidewalk must be temporarily narrowed during construction (e.g., deck installation), it would be restored to its original width during the majority of construction period. In some places this may require placing the temporary sidewalk actually on the deck. Each sidewalk design should be of good quality and approved by the Resident Engineer prior to construction. Handicapped access would be maintained during construction where feasible.

## III. Soils/Geology

- **Underpin existing buildings, where deemed necessary, to protect existing structures from potential damage that could result from excessive ground movements during construction.** The design of the tunneling and the excavation procedures (and construction sequence), and the design of the temporary support system will be developed with the objective of controlling ground deformations within small enough levels to avoid damage to adjacent structures.

Where the risk of damage to adjacent structures is too great, special measures may be implemented such as: (1) underpinning, (2) ground improvement, and/or (3) strengthening of existing structures to mitigate the risks.

The cut-and-cover alignment passes near settlement-sensitive structures in the vicinity of the intersection of Second and Townsend streets, including buildings in the Rincon Point / South Beach Historic Warehouse – Industrial District (i.e., 166-178, 180, , and 350-360 Townsend Street).

The tunnel alignment passes under a number of old and settlement-sensitive structures in the vicinity of the intersection of Second and Townsend streets, including buildings in the Rincon Point / South Beach Historic Warehouse – Industrial District (i.e., 130, 136, 144-146, 148-154, and 162-164 "Townsend Street; 634, 640, 650, and 670-680 Second Street; and 301-321 Brannan Street).

Even though the tunnel will be excavated using the stacked drift method, and even though the tunnel will be excavated in the Franciscan Rock formation, the risk of potential adverse impacts of tunneling on the existing buildings must be assessed, because the rock cover over the tunnel is rather shallow.

As part of the initial studies performed in 1996, preliminary plans were developed to protect/strengthen existing structures to mitigate the risk of adverse impacts of tunneling on existing structures. Underpinning, if it is deemed necessary, is one of the options for mitigating adverse effects of tunneling on the existing buildings. Underpinning involves modification of the foundations of the building so that the superstructure loads can be transferred beyond the zone of influence of tunneling. Underpinning may include internal strengthening of the superstructure, bracing, reinforcing the existing foundations, or replacing the existing foundations with deep foundations that are embedded outside the zone of influence of tunneling.

Other alternatives, in lieu of underpinning, involve strengthening of the rock between the building and the crown of the tunnel. Grouting in combination with inclined pin piles can be used not only to strengthen the rock but to make the rock mass over the tunnel act as a rigid beam, which would allow construction of the tunnels with no adverse effects on the buildings that are supported on shallow foundations over the tunnel.

Preliminary plans for underpinning have been developed that allow cost estimates to be made for underpinning. During the detailed design phase of the Project, underpinning plans will be developed specific to each of the buildings that may require it. It is not necessary at this stage of the Project to develop detailed underpinning plans.

These issues will be addressed on a case by case basis, along the alignment, during the detailed design phase of the Project. The methodology that is proposed for the Caltrain Downtown Extension, i.e. to design the support system to control ground deformations within tolerances, and selectivity strengthen structures that may be too weak to resist even small deformations, was successfully used for the Muni Metro Turnback project, and should be effective for the Caltrain Downtown Extension Project as well.

- Assure proper design and construction of pile supported foundations for structures to control potential settlement of the surface. Stability of excavations resultant impacts on adjacent structures can be controlled within tolerable limits by proper design and implementation of the excavation shoring systems.

## IV. Air Emissions

- Upon completion of the construction phase, buildings with visible signs of dirt and debris from the construction site shall be power washed and/or painted (given that permission is obtained from the property owner to gain access to and wash the property with no fee charged by the owner).

## V. Vibration

- **Limit or prohibit use of construction techniques that create high vibration levels.** At a minimum, processes such as pile driving would be prohibited at distances less than 250 feet from residences.

- **Restrict procedures that contractors can use in vibration sensitive areas.** It is often possible to employ alternative techniques that create lower vibration levels. For example, unrestricted pile driving is one activity that has considerable potential for causing annoying vibration. Using the cast-in-drilled-hole piling method instead will eliminate most potential for vibration impact from the piling.

- Require vibration monitoring during vibration intensive activities.

- Restrict the hours of vibration intensive activities such as pile driving to weekdays during daytime hours.

- Investigate alternative construction methods and practices to reduce the impacts in coordination with the construction contractor if resident annoyance from vibration becomes a problem.

- Include specific limits, practices and monitoring and reporting procedures for the use of controlled detonation. Controlled detonation may be required during tunnel construction through rock for both the cut-and-cover and stacked-drift construction methods, subject to additional geotechnical investigations and other considerations that would be determined during the final design and construction phases of the project. Any use of controlled detonation would be closely controlled and monitored to avoid damage to existing structures. Specific limits, practices, and monitoring and reporting procedures would be included within the contract documents to ensure that such construction methods, if used, would not exceed safety criteria.

- **Use high-resilience track fasteners or a resiliently supported tie system** for the Caltrain downtown extension for areas projected to exceed vibration criteria.



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